



24

# SEQUENCE LISTING

<110> Fishman, Mark C.

<120> Methods for Diagnosing and Treating  
Heart Disease

<130> 00786/381002

<140> US 09/759,508

<141> 2001-01-12

<150> US 60/175,787

<151> 2000-01-12

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| acacaaaaga  | cttctgaaat  | tacacctcag  | aagaaagctg  | ttgtccaaga  | ggaaatttcc  | 79560 |
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 <212> PRT  
 <213> Homo sapiens

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Pro Val Pro Glu Val Ser Trp Phe Arg Asp Gly Gln Val Ile Ser Thr
35          40          45
Ser Thr Leu Pro Gly Val Gln Ile Ser Phe Ser Asp Gly Arg Ala Lys
50          55          60
Leu Thr Ile Pro Ala Val Thr Lys Ala Asn Ser Gly Arg Tyr Ser Leu
65          70          75          80
Lys Ala Thr Asn Gly Ser Gly Gln Ala Thr Ser Thr Ala Glu Leu Leu
85          90          95
Val Lys Ala Glu Thr Ala Pro Pro Asn Phe Val Gln Arg Leu Gln Ser
100          105          110
Met Thr Val Arg Gln Gly Ser Gln Val Arg Leu Gln Val Arg Val Thr

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-25-

|      |      |     |     |      |      |      |      |     |      |      |     |      |     |      |      |
|------|------|-----|-----|------|------|------|------|-----|------|------|-----|------|-----|------|------|
| Gln  | Val  | Gln | Ile | Thr  | Gln  | Glu  | Lys  | Met | Arg  | Lys  | Glu | Ala  | Glu | Lys  | Thr  |
|      |      | 595 |     |      |      |      | 600  |     |      |      |     | 605  |     |      |      |
| Ala  | Leu  | Ser | Thr | Ile  | Ala  | Val  | Ala  | Thr | Ala  | Lys  | Ala | Lys  | Glu | Gln  | Glu  |
|      | 610  |     |     |      |      | 615  |      |     |      |      | 620 |      |     |      |      |
| Thr  | Ile  | Leu | Arg | Thr  | Arg  | Glu  | Thr  | Met | Ala  | Thr  | Arg | Gln  | Glu | Gln  | Ile  |
| 625  |      |     |     |      | 630  |      |      |     |      | 635  |     |      |     |      | 640  |
| Gln  | Val  | Thr | His | Gly  | Lys  | Val  | Asp  | Val | Gly  | Lys  | Lys | Ala  | Glu | Ala  | Val  |
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| Ala  | Thr  | Val | Val | Ala  | Ala  | Val  | Asp  | Gln | Ala  | Arg  | Val | Arg  | Glu | Pro  | Arg  |
|      |      |     | 660 |      |      |      |      | 665 |      |      |     |      | 670 |      |      |
| Glu  | Pro  | Gly | His | Leu  | Glu  | Glu  | Ser  | Tyr | Ala  | Gln  | Gln | Thr  | Thr | Leu  | Glu  |
|      |      | 675 |     |      |      |      | 680  |     |      |      |     | 685  |     |      |      |
| Tyr  | Gly  | Tyr | Lys | Glu  | Arg  | Ile  | Ser  | Ala | Ala  | Lys  | Val | Ala  | Glu | Pro  | Pro  |
|      | 690  |     |     |      |      | 695  |      |     |      |      | 700 |      |     |      |      |
| Gln  | Arg  | Pro | Ala | Ser  | Glu  | Pro  | His  | Val | Val  | Pro  | Lys | Ala  | Val | Lys  | Pro  |
| 705  |      |     |     |      | 710  |      |      |     |      | 715  |     |      |     |      | 720  |
| Arg  | Val  | Ile | Gln | Ala  | Pro  | Ser  | Glu  | Thr | His  | Ile  | Lys | Thr  | Thr | Asp  | Gln  |
|      |      |     |     | 725  |      |      |      |     | 730  |      |     |      |     | 735  |      |
| Lys  | Gly  | Met | His | Ile  | Ser  | Ser  | Gln  | Ile | Lys  | Lys  | Thr | Thr  | Asp | Leu  | Thr  |
|      |      |     | 740 |      |      |      |      | 745 |      |      |     |      | 750 |      |      |
| Thr  | Glu  | Arg | Leu | Val  | His  | Val  | Asp  | Lys | Arg  | Pro  | Arg | Thr  | Ala | Ser  | Pro  |
|      |      | 755 |     |      |      |      | 760  |     |      |      |     | 765  |     |      |      |
| His  | Phe  | Thr | Val | Ser  | Lys  | Ile  | Ser  | Val | Pro  | Lys  | Thr | Glu  | His | Gly  | Tyr  |
|      | 770  |     |     |      |      | 775  |      |     |      |      | 780 |      |     |      |      |
| Glu  | Ala  | Ser | Ile | Ala  | Gly  | Ser  | Ala  | Ile | Ala  | Thr  | Leu | Gln  | Lys | Glu  | Leu  |
| 785  |      |     |     |      | 790  |      |      |     |      | 795  |     |      |     |      | 800  |
| Ser  | Ala  | Thr | Ser | Ser  | Ala  | Gln  | Lys  | Ile | Thr  | Lys  | Ser | Val  | Lys | Ala  | Pro  |
|      |      |     |     | 805  |      |      |      |     | 810  |      |     |      |     | 815  |      |
| Thr  | Val  | Lys | Pro | Ser  | Glu  | Thr  | Arg  | Val | Arg  | Ala  | Glu | Pro  | Thr | Pro  | Leu  |
|      |      |     | 820 |      |      |      |      | 825 |      |      |     |      | 830 |      |      |
| Pro  | Gln  | Phe | Pro | Phe  | Ala  | Asp  | Thr  | Pro | Asp  | Thr  | Tyr | Lys  | Ser | Glu  | Ala  |
|      |      | 835 |     |      |      |      | 840  |     |      |      |     | 845  |     |      |      |
| Gly  | Val  | Glu | Val | Lys  | Lys  | Glu  | Val  | Gly | Val  | Ser  | Ile | Thr  | Gly | Thr  | Thr  |
|      | 850  |     |     |      |      | 855  |      |     |      |      | 860 |      |     |      |      |
| Val  | Arg  | Glu | Glu | Arg  | Phe  | Glu  | Val  | Leu | His  | Gly  | Arg | Glu  | Ala | Lys  | Val  |
| 865  |      |     |     |      | 870  |      |      |     |      | 875  |     |      |     |      | 880  |
| Thr  | Glu  | Thr | Ala | Arg  | Val  | Pro  | Ala  | Pro | Val  | Glu  | Ile | Pro  | Val | Thr  | Pro  |
|      |      |     |     | 885  |      |      |      |     | 890  |      |     |      |     | 895  |      |
| Pro  | Thr  | Leu | Val | Ser  | Gly  | Leu  | Lys  | Asn | Val  | Thr  | Val | Ile  | Glu | Gly  | Glu  |
|      |      | 900 |     |      |      |      |      | 905 |      |      |     |      | 910 |      |      |
| Ser  | Val  | Thr | Leu | Glu  | Cys  | His  | Ile  | Ser | Gly  | Tyr  | Pro | Ser  | Pro | Thr  | Val  |
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| Thr  | Trp  | Tyr | Arg | Glu  | Asp  | Tyr  | Gln  | Ile | Glu  | Ser  | Ser | Ile  | Asp | Phe  | Gln  |
|      | 930  |     |     |      |      | 935  |      |     |      |      | 940 |      |     |      |      |
| Ile  | Thr  | Phe | Gln | Ser  | Gly  | Ile  | Ala  | Arg | Leu  | Met  | Ile | Arg  | Glu | Ala  | Phe  |
| 945  |      |     |     |      | 950  |      |      |     |      | 955  |     |      |     |      | 960  |
| Ala  | Glu  | Asp | Ser | Gly  | Arg  | Phe  | Thr  | Cys | Ser  | Ala  | Val | Asn  | Glu | Ala  | Gly  |
|      |      |     |     | 965  |      |      |      |     | 970  |      |     |      |     | 975  |      |
| Thr  | Val  | Ser | Thr | Ser  | Cys  | Tyr  | Leu  | Ala | Val  | Gln  | Val | Ser  | Glu | Glu  | Phe  |
|      |      |     | 980 |      |      |      |      | 985 |      |      |     |      | 990 |      |      |
| Glu  | Lys  | Glu | Thr | Thr  | Ala  | Val  | Thr  | Glu | Lys  | Phe  | Thr | Thr  | Glu | Glu  | Lys  |
|      |      |     | 995 |      |      |      | 1000 |     |      |      |     | 1005 |     |      |      |
| Arg  | Phe  | Val | Glu | Ser  | Arg  | Asp  | Val  | Val | Met  | Thr  | Asp | Thr  | Ser | Leu  | Thr  |
|      | 1010 |     |     |      |      | 1015 |      |     |      |      |     | 1020 |     |      |      |
| Glu  | Glu  | Gln | Ala | Gly  | Pro  | Gly  | Glu  | Pro | Ala  | Ala  | Pro | Tyr  | Phe | Ile  | Thr  |
| 1025 |      |     |     |      | 1030 |      |      |     |      | 1035 |     |      |     |      | 1040 |
| Lys  | Pro  | Val | Val | Gln  | Lys  | Leu  | Val  | Glu | Gly  | Gly  | Ser | Val  | Val | Phe  | Gly  |
|      |      |     |     | 1045 |      |      |      |     | 1050 |      |     |      |     | 1055 |      |
| Cys  | Gln  | Val | Gly | Gly  | Asn  | Pro  | Lys  | Pro | His  | Val  | Tyr | Trp  | Lys | Lys  | Ser  |



Pro Asn Pro Asp Ile Val Trp Leu Lys Asn Ser Asp Ile Ile Val Pro  
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 His Lys Tyr Pro Lys Ile Arg Ile Glu Gly Thr Lys Gly Glu Ala Ala  
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 Leu Lys Ile Asp Ser Thr Val Ser Gln Asp Ser Ala Trp Tyr Thr Ala  
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 Thr Ala Ile Asn Lys Ala Gly Arg Asp Thr Thr Arg Cys Lys Val Asn  
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 Pro Arg Gly Thr Tyr Arg Ala Lys Glu Ile Ala Ala Pro Glu Leu Glu  
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 1635 1640 1645  
 Tyr Asp Lys Glu Lys Gln Gln Lys Pro Phe Phe Lys Lys Lys Leu Thr  
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 Ser Leu Arg Leu Lys Arg Phe Gly Pro Ala His Phe Glu Cys Arg Leu  
 1665 1670 1675 1680  
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 1685 1690 1695  
 Lys Pro Leu Glu Ala Ala Asn Arg Leu Arg Met Ile Asn Glu Phe Gly  
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 Tyr Cys Ser Leu Asp Tyr Gly Val Ala Tyr Ser Arg Asp Ser Gly Ile  
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 Ile Thr Cys Arg Ala Thr Asn Lys Tyr Gly Thr Asp His Thr Ser Ala  
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 Thr Leu Ile Val Lys Asp Glu Lys Ser Leu Val Glu Glu Ser Gln Leu  
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 1780 1785 1790  
 Gln Lys Pro Asp Ile Val Leu Tyr Pro Glu Pro Val Arg Val Leu Glu  
 1795 1800 1805  
 Gly Glu Thr Ala Arg Phe Arg Cys Arg Val Thr Gly Tyr Pro Gln Pro  
 1810 1815 1820  
 Lys Val Asn Trp Tyr Leu Asn Gly Gln Leu Ile Arg Lys Ser Lys Arg  
 1825 1830 1835 1840  
 Phe Arg Val Arg Tyr Asp Gly Ile His Tyr Leu Asp Ile Val Asp Cys  
 1845 1850 1855  
 Lys Ser Tyr Asp Thr Gly Glu Val Lys Val Thr Ala Glu Asn Pro Glu  
 1860 1865 1870  
 Gly Val Ile Glu His Lys Val Lys Leu Glu Ile Gln Gln Arg Glu Asp  
 1875 1880 1885  
 Phe Arg Ser Val Leu Arg Arg Ala Pro Glu Pro Arg Pro Glu Phe His  
 1890 1895 1900  
 Val His Glu Pro Gly Lys Leu Gln Phe Glu Val Gln Lys Val Asp Arg  
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 1925 1930 1935  
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 1940 1945 1950  
 Ser Lys Phe Lys Arg Arg Thr Glu Glu Gly Tyr Tyr Glu Ala Ile Thr  
 1955 1960 1965  
 Ala Val Glu Leu Lys Ser Arg Lys Lys Asp Glu Ser Tyr Glu Glu Leu  
 1970 1975 1980  
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 1985 1990 1995 2000  
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| 2005 |     |     |     |     | 2010 |     |     |     |     | 2015 |     |     |     |     |     |
|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|
| Thr  | Phe | Lys | Pro | Asp | Lys  | Ile | Glu | Leu | Ser | Pro  | Ser | Met | Glu | Ala | Pro |
| 2020 |     |     |     |     | 2025 |     |     |     |     | 2030 |     |     |     |     |     |
| Lys  | Ile | Phe | Glu | Arg | Ile  | Gln | Ser | Gln | Thr | Val  | Gly | Gln | Gly | Ser | Asp |
| 2035 |     |     |     |     | 2040 |     |     |     |     | 2045 |     |     |     |     |     |
| Ala  | His | Phe | Arg | Val | Arg  | Val | Val | Gly | Lys | Pro  | Asp | Pro | Glu | Cys | Glu |
| 2050 |     |     |     |     | 2055 |     |     |     |     | 2060 |     |     |     |     |     |
| Trp  | Tyr | Lys | Asn | Gly | Val  | Lys | Ile | Glu | Arg | Ser  | Asp | Arg | Ile | Tyr | Trp |
| 2065 |     |     |     |     | 2070 |     |     |     |     | 2075 |     |     |     |     |     |
| Tyr  | Trp | Pro | Glu | Asp | Asn  | Val | Cys | Glu | Leu | Val  | Ile | Arg | Asp | Val | Thr |
| 2085 |     |     |     |     | 2090 |     |     |     |     | 2095 |     |     |     |     |     |
| Ala  | Glu | Asp | Ser | Ala | Ser  | Ile | Met | Val | Lys | Ala  | Ile | Asn | Ile | Ala | Gly |
| 2100 |     |     |     |     | 2105 |     |     |     |     | 2110 |     |     |     |     |     |
| Glu  | Thr | Ser | Ser | His | Ala  | Phe | Leu | Leu | Val | Gln  | Ala | Lys | Gln | Leu | Ile |
| 2115 |     |     |     |     | 2120 |     |     |     |     | 2125 |     |     |     |     |     |
| Thr  | Phe | Thr | Gln | Glu | Leu  | Gln | Asp | Val | Val | Ala  | Lys | Glu | Lys | Asp | Thr |
| 2130 |     |     |     |     | 2135 |     |     |     |     | 2140 |     |     |     |     |     |
| Met  | Ala | Thr | Phe | Glu | Cys  | Glu | Thr | Ser | Glu | Pro  | Phe | Val | Lys | Val | Lys |
| 2145 |     |     |     |     | 2150 |     |     |     |     | 2155 |     |     |     |     |     |
| Trp  | Tyr | Lys | Asp | Gly | Met  | Glu | Val | His | Glu | Gly  | Asp | Lys | Tyr | Arg | Met |
| 2165 |     |     |     |     | 2170 |     |     |     |     | 2175 |     |     |     |     |     |
| His  | Ser | Asp | Arg | Lys | Val  | His | Phe | Leu | Ser | Ile  | Leu | Thr | Ile | Asp | Thr |
| 2180 |     |     |     |     | 2185 |     |     |     |     | 2190 |     |     |     |     |     |
| Ser  | Asp | Ala | Glu | Asp | Tyr  | Ser | Cys | Val | Leu | Val  | Glu | Asp | Glu | Asn | Val |
| 2195 |     |     |     |     | 2200 |     |     |     |     | 2205 |     |     |     |     |     |
| Lys  | Thr | Thr | Ala | Lys | Leu  | Ile | Val | Glu | Gly | Ala  | Val | Val | Glu | Phe | Val |
| 2210 |     |     |     |     | 2215 |     |     |     |     | 2220 |     |     |     |     |     |
| Lys  | Glu | Leu | Gln | Asp | Ile  | Glu | Val | Pro | Glu | Ser  | Tyr | Ser | Gly | Glu | Leu |
| 2225 |     |     |     |     | 2230 |     |     |     |     | 2235 |     |     |     |     |     |
| Glu  | Cys | Ile | Val | Ser | Pro  | Glu | Asn | Ile | Glu | Gly  | Lys | Trp | Tyr | His | Asn |
| 2245 |     |     |     |     | 2250 |     |     |     |     | 2255 |     |     |     |     |     |
| Asp  | Val | Glu | Leu | Lys | Ser  | Asn | Gly | Lys | Tyr | Thr  | Ile | Thr | Ser | Arg | Arg |
| 2260 |     |     |     |     | 2265 |     |     |     |     | 2270 |     |     |     |     |     |
| Gly  | Arg | Gln | Asn | Leu | Thr  | Val | Lys | Asp | Val | Thr  | Lys | Glu | Asp | Gln | Gly |
| 2275 |     |     |     |     | 2280 |     |     |     |     | 2285 |     |     |     |     |     |
| Glu  | Tyr | Ser | Phe | Val | Ile  | Asp | Gly | Lys | Lys | Thr  | Thr | Cys | Lys | Leu | Lys |
| 2290 |     |     |     |     | 2295 |     |     |     |     | 2300 |     |     |     |     |     |
| Met  | Lys | Pro | Arg | Pro | Ile  | Ala | Ile | Leu | Gln | Gly  | Leu | Ser | Asp | Gln | Lys |
| 2305 |     |     |     |     | 2310 |     |     |     |     | 2315 |     |     |     |     |     |
| Val  | Cys | Glu | Gly | Asp | Ile  | Val | Gln | Leu | Glu | Val  | Lys | Val | Ser | Leu | Glu |
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| Ser  | Val | Glu | Gly | Val | Trp  | Met | Lys | Asp | Gly | Gln  | Glu | Val | Gln | Pro | Ser |
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| Asp  | Arg | Val | His | Ile | Val  | Ile | Asp | Lys | Gln | Ser  | His | Met | Leu | Leu | Ile |
| 2355 |     |     |     |     | 2360 |     |     |     |     | 2365 |     |     |     |     |     |
| Glu  | Asp | Met | Thr | Lys | Glu  | Asp | Ala | Gly | Asn | Tyr  | Ser | Phe | Thr | Ile | Pro |
| 2370 |     |     |     |     | 2375 |     |     |     |     | 2380 |     |     |     |     |     |
| Ala  | Leu | Gly | Leu | Ser | Thr  | Ser | Gly | Arg | Val | Ser  | Val | Tyr | Ser | Val | Asp |
| 2385 |     |     |     |     | 2390 |     |     |     |     | 2395 |     |     |     |     |     |
| Val  | Ile | Thr | Pro | Leu | Lys  | Asp | Val | Asn | Val | Ile  | Glu | Gly | Thr | Lys | Ala |
| 2405 |     |     |     |     | 2410 |     |     |     |     | 2415 |     |     |     |     |     |
| Val  | Leu | Glu | Cys | Lys | Val  | Ser | Val | Pro | Asp | Val  | Thr | Ser | Val | Lys | Trp |
| 2420 |     |     |     |     | 2425 |     |     |     |     | 2430 |     |     |     |     |     |
| Tyr  | Leu | Asn | Asp | Glu | Gln  | Ile | Lys | Pro | Asp | Asp  | Arg | Val | Gln | Ala | Ile |
| 2435 |     |     |     |     | 2440 |     |     |     |     | 2445 |     |     |     |     |     |
| Val  | Lys | Gly | Thr | Lys | Gln  | Arg | Leu | Val | Ile | Asn  | Arg | Thr | His | Ala | Ser |
| 2450 |     |     |     |     | 2455 |     |     |     |     | 2460 |     |     |     |     |     |
| Asp  | Glu | Gly | Pro | Tyr | Lys  | Leu | Ile | Val | Gly | Arg  | Val | Glu | Thr | Asn | Cys |
| 2465 |     |     |     |     | 2470 |     |     |     |     | 2475 |     |     |     |     |     |
|      |     |     |     |     |      |     |     |     |     | 2480 |     |     |     |     |     |

Asn Leu Ser Val Glu Lys Ile Lys Ile Ile Arg Gly Leu Arg Asp Leu  
 2485 2490 2495  
 Thr Cys Thr Glu Thr Gln Asn Val Val Phe Glu Val Glu Leu Ser His  
 2500 2505 2510  
 Ser Gly Ile Asp Val Leu Trp Asn Phe Lys Asp Lys Glu Ile Lys Pro  
 2515 2520 2525  
 Ser Ser Lys Tyr Lys Ile Glu Ala His Gly Lys Ile Tyr Lys Leu Thr  
 2530 2535 2540  
 Val Leu Asn Met Met Lys Asp Asp Glu Gly Lys Tyr Thr Phe Tyr Ala  
 2545 2550 2555 2560  
 Gly Glu Asn Met Thr Ser Gly Lys Leu Thr Val Ala Gly Gly Ala Ile  
 2565 2570 2575  
 Ser Lys Pro Leu Thr Asp Gln Thr Val Ala Glu Ser Gln Glu Ala Val  
 2580 2585 2590  
 Phe Glu Cys Glu Val Ala Asn Pro Asp Ser Lys Gly Glu Trp Leu Arg  
 2595 2600 2605  
 Asp Gly Lys His Leu Pro Leu Thr Asn Asn Ile Arg Ser Glu Ser Asp  
 2610 2615 2620  
 Gly His Lys Arg Arg Leu Ile Ile Ala Ala Thr Lys Leu Asp Asp Ile  
 2625 2630 2635 2640  
 Gly Glu Tyr Thr Tyr Lys Val Ala Thr Ser Lys Thr Ser Ala Lys Leu  
 2645 2650 2655  
 Lys Val Glu Ala Val Lys Ile Lys Lys Thr Leu Lys Asn Leu Thr Val  
 2660 2665 2670  
 Thr Glu Thr Gln Asp Ala Val Phe Thr Val Glu Leu Thr His Pro Asn  
 2675 2680 2685  
 Val Lys Gly Val Gln Trp Ile Lys Asn Gly Val Val Leu Glu Ser Asn  
 2690 2695 2700  
 Glu Lys Tyr Ala Ile Ser Val Lys Gly Thr Ile Tyr Ser Leu Arg Ile  
 2705 2710 2715 2720  
 Lys Asn Cys Ala Ile Val Asp Glu Ser Val Tyr Gly Phe Arg Leu Gly  
 2725 2730 2735  
 Arg Leu Gly Ala Ser Ala Arg Leu His Val Glu Thr Val Lys Ile Ile  
 2740 2745 2750  
 Lys Lys Pro Lys Asp Val Thr Ala Leu Glu Asn Ala Thr Val Ala Phe  
 2755 2760 2765  
 Glu Val Ser Val Ser His Asp Thr Val Pro Val Lys Trp Phe His Lys  
 2770 2775 2780  
 Ser Val Glu Ile Lys Pro Ser Asp Lys His Arg Leu Val Ser Glu Arg  
 2785 2790 2795 2800  
 Lys Val His Lys Leu Met Leu Gln Asn Ile Ser Pro Ser Asp Ala Gly  
 2805 2810 2815  
 Glu Tyr Thr Ala Val Val Gly Gln Leu Glu Cys Lys Ala Lys Leu Phe  
 2820 2825 2830  
 Val Glu Thr Leu His Ile Thr Lys Thr Met Lys Asn Ile Glu Val Pro  
 2835 2840 2845  
 Glu Thr Lys Thr Ala Ser Phe Glu Cys Glu Val Ser His Phe Asn Val  
 2850 2855 2860  
 Pro Ser Met Trp Leu Lys Asn Gly Val Glu Ile Glu Met Ser Glu Lys  
 2865 2870 2875 2880  
 Phe Lys Ile Val Val Gln Gly Lys Leu His Gln Leu Ile Ile Met Asn  
 2885 2890 2895  
 Thr Ser Thr Glu Asp Ser Ala Glu Tyr Thr Phe Val Cys Gly Asn Asp  
 2900 2905 2910  
 Gln Val Ser Ala Thr Leu Thr Val Thr Pro Ile Met Ile Thr Ser Met  
 2915 2920 2925  
 Leu Lys Asp Ile Asn Ala Glu Glu Lys Asp Thr Ile Thr Phe Glu Val  
 2930 2935 2940  
 Thr Val Asn Tyr Glu Gly Ile Ser Tyr Lys Trp Leu Lys Asn Gly Val

|   |      |      |      |      |      |      |
|---|------|------|------|------|------|------|
| 2945  |      | 2950 |      | 2955 |      | 2960 |
| Glu Ile Lys Ser Thr Asp Lys Cys Gln Met Arg Thr Lys Lys Leu Thr |      |      |      |      |      |      |
|   | 2965 |      |      | 2970 |      | 2975 |
| His Ser Leu Asn Ile Arg Asn Val His Phe Gly Asp Ala Ala Asp Tyr |      |      |      |      |      |      |
|   | 2980 |      |      | 2985 |      | 2990 |
| Thr Phe Val Ala Gly Lys Ala Thr Ser Thr Ala Thr Leu Tyr Val Glu |      |      |      |      |      |      |
|   | 2995 |      | 3000 |      | 3005 |      |
| Ala Arg His Ile Glu Phe Arg Lys His Ile Lys Asp Ile Lys Val Leu |      |      |      |      |      |      |
|   | 3010 |      | 3015 |      | 3020 |      |
| Glu Lys Lys Arg Ala Met Phe Glu Cys Glu Val Ser Glu Pro Asp Ile |      |      |      |      |      |      |
| 3025  |      | 3030 |      | 3035 |      | 3040 |
| Thr Val Gln Trp Met Lys Asp Asp Gln Glu Leu Gln Ile Thr Asp Arg |      |      |      |      |      |      |
|   | 3045 |      | 3050 |      |      | 3055 |
| Ile Lys Ile Gln Lys Glu Lys Tyr Val His Arg Leu Leu Ile Pro Ser |      |      |      |      |      |      |
|   | 3060 |      | 3065 |      |      | 3070 |
| Thr Arg Met Ser Asp Ala Gly Lys Tyr Thr Val Val Ala Gly Gly Asn |      |      |      |      |      |      |
|   | 3075 |      | 3080 |      | 3085 |      |
| Val Ser Thr Ala Lys Leu Phe Val Glu Gly Arg Asp Val Arg Ile Arg |      |      |      |      |      |      |
|   | 3090 |      | 3095 |      | 3100 |      |
| Ser Ile Lys Lys Glu Val Gln Val Ile Glu Lys Gln Arg Ala Val Val |      |      |      |      |      |      |
| 3105  |      | 3110 |      | 3115 |      | 3120 |
| Glu Phe Glu Val Asn Glu Asp Asp Val Asp Ala His Trp Tyr Lys Asp |      |      |      |      |      |      |
|   | 3125 |      | 3130 |      |      | 3135 |
| Gly Ile Glu Ile Asn Phe Gln Val Gln Glu Arg His Lys Tyr Val Val |      |      |      |      |      |      |
|   | 3140 |      | 3145 |      |      | 3150 |
| Glu Arg Arg Ile His Arg Met Phe Ile Ser Glu Thr Arg Gln Ser Asp |      |      |      |      |      |      |
|   | 3155 |      | 3160 |      | 3165 |      |
| Ala Gly Glu Tyr Thr Phe Val Ala Gly Arg Asn Arg Ser Ser Val Thr |      |      |      |      |      |      |
|   | 3170 |      | 3175 |      | 3180 |      |
| Leu Tyr Val Asn Ala Pro Glu Pro Pro Gln Val Leu Gln Glu Leu Gln |      |      |      |      |      |      |
| 3185  |      | 3190 |      | 3195 |      | 3200 |
| Pro Val Thr Val Gln Ser Gly Lys Pro Ala Arg Phe Cys Ala Met Ile |      |      |      |      |      |      |
|   | 3205 |      | 3210 |      |      | 3215 |
| Ser Gly Arg Pro Gln Pro Lys Ile Ser Trp Tyr Lys Glu Glu Gln Leu |      |      |      |      |      |      |
|   | 3220 |      | 3225 |      |      | 3230 |
| Leu Ser Thr Gly Phe Lys Cys Lys Phe Leu His Asp Gly Gln Glu Tyr |      |      |      |      |      |      |
|   | 3235 |      | 3240 |      | 3245 |      |
| Thr Leu Leu Ile Glu Ala Phe Pro Glu Asp Ala Ala Val Tyr Thr     |      |      |      |      |      |      |
|   | 3250 |      | 3255 |      | 3260 |      |
| Cys Glu Ala Lys Asn Asp Tyr Gly Val Ala Thr Thr Ser Ala Ser Leu |      |      |      |      |      |      |
| 3265  |      | 3270 |      | 3275 |      | 3280 |
| Ser Val Glu Val Pro Glu Val Val Ser Pro Asp Gln Glu Met Pro Val |      |      |      |      |      |      |
|   | 3285 |      | 3290 |      |      | 3295 |
| Tyr Pro Pro Ala Ile Ile Thr Pro Leu Gln Asp Thr Val Thr Ser Glu |      |      |      |      |      |      |
|   | 3300 |      | 3305 |      |      | 3310 |
| Gly Gln Pro Ala Arg Phe Gln Cys Arg Val Ser Gly Thr Asp Leu Lys |      |      |      |      |      |      |
|   | 3315 |      | 3320 |      | 3325 |      |
| Val Ser Trp Tyr Ser Lys Asp Lys Lys Ile Lys Pro Ser Arg Phe Phe |      |      |      |      |      |      |
|   | 3330 |      | 3335 |      | 3340 |      |
| Arg Met Thr Gln Phe Glu Asp Thr Tyr Gln Leu Glu Ile Ala Glu Ala |      |      |      |      |      |      |
| 3345  |      | 3350 |      | 3355 |      | 3360 |
| Tyr Pro Glu Asp Glu Gly Thr Tyr Thr Phe Val Ala Asn Asn Ala Val |      |      |      |      |      |      |
|   | 3365 |      | 3370 |      |      | 3375 |
| Gly Gln Val Ser Ser Thr Ala Asn Leu Ser Leu Glu Ala Pro Glu Ser |      |      |      |      |      |      |
|   | 3380 |      | 3385 |      |      | 3390 |
| Ile Leu His Glu Arg Ile Glu Gln Glu Ile Glu Met Glu Met Lys Glu |      |      |      |      |      |      |
|   | 3395 |      | 3400 |      | 3405 |      |
| Phe Ser Ser Ser Phe Leu Ser Ala Glu Glu Glu Gly Leu His Ser Ala |      |      |      |      |      |      |
|   | 3410 |      | 3415 |      | 3420 |      |

Glu Leu Gln Leu Ser Lys Ile Asn Glu Thr Leu Glu Leu Leu Ser Glu  
 3425 3430 3435 3440  
 Ser Pro Val Tyr Pro Thr Lys Phe Asp Ser Glu Lys Glu Gly Thr Gly  
 3445 3450 3455  
 Pro Ile Phe Ile Lys Glu Val Ser Asn Ala Asp Ile Ser Met Gly Asp  
 3460 3465 3470  
 Val Ala Thr Leu Ser Val Thr Val Ile Gly Ile Pro Lys Pro Lys Ile  
 3475 3480 3485  
 Gln Trp Phe Phe Asn Gly Val Leu Leu Thr Pro Ser Ala Asp Tyr Lys  
 3490 3495 3500  
 Phe Val Phe Asp Gly Asp Asp His Ser Leu Ile Ile Leu Phe Thr Lys  
 3505 3510 3515 3520  
 Leu Glu Asp Glu Gly Glu Tyr Thr Cys Met Ala Ser Asn Asp Tyr Gly  
 3525 3530 3535  
 Lys Thr Ile Cys Ser Ala Tyr Leu Lys Ile Asn Ser Lys Gly Glu Gly  
 3540 3545 3550  
 His Lys Asp Thr Glu Thr Glu Ser Ala Val Ala Lys Ser Leu Glu Lys  
 3555 3560 3565  
 Leu Gly Gly Pro Cys Pro Pro His Phe Leu Lys Glu Leu Lys Pro Ile  
 3570 3575 3580  
 Arg Cys Ala Gln Gly Leu Pro Ala Ile Phe Glu Tyr Thr Val Val Gly  
 3585 3590 3595 3600  
 Glu Pro Ala Pro Thr Val Thr Trp Phe Lys Glu Asn Lys Gln Leu Cys  
 3605 3610 3615  
 Thr Ser Val Tyr Tyr Thr Ile Ile His Asn Pro Asn Gly Ser Gly Thr  
 3620 3625 3630  
 Phe Ile Val Asn Asp Pro Gln Arg Glu Asp Ser Gly Leu Tyr Ile Cys  
 3635 3640 3645  
 Lys Ala Glu Asn Met Leu Gly Glu Ser Thr Cys Ala Ala Glu Leu Leu  
 3650 3655 3660  
 Val Leu Leu Glu Asp Thr Asp Met Thr Asp Thr Pro Cys Lys Ala Lys  
 3665 3670 3675 3680  
 Ser Thr Pro Glu Ala Pro Glu Asp Phe Pro Gln Thr Pro Leu Lys Gly  
 3685 3690 3695  
 Pro Ala Val Glu Ala Leu Asp Ser Glu Gln Glu Ile Ala Thr Phe Val  
 3700 3705 3710  
 Lys Asp Thr Ile Leu Lys Ala Ala Leu Ile Thr Glu Glu Asn Gln Gln  
 3715 3720 3725  
 Leu Ser Tyr Glu His Ile Ala Lys Ala Asn Glu Leu Ser Ser Gln Leu  
 3730 3735 3740  
 Pro Leu Gly Ala Gln Glu Leu Gln Ser Ile Leu Glu Gln Asp Lys Leu  
 3745 3750 3755 3760  
 Thr Pro Glu Ser Thr Arg Glu Phe Leu Cys Ile Asn Gly Ser Ile His  
 3765 3770 3775  
 Phe Gln Pro Leu Lys Glu Pro Ser Pro Asn Leu Gln Leu Gln Ile Val  
 3780 3785 3790  
 Gln Ser Gln Lys Thr Phe Ser Lys Glu Gly Ile Leu Met Pro Glu Glu  
 3795 3800 3805  
 Pro Glu Thr Gln Ala Val Leu Ser Asp Thr Glu Lys Ile Phe Pro Ser  
 3810 3815 3820  
 Ala Met Ser Ile Glu Gln Ile Asn Ser Leu Thr Val Glu Pro Leu Lys  
 3825 3830 3835 3840  
 Thr Leu Leu Ala Glu Pro Glu Gly Asn Tyr Pro Gln Ser Ser Ile Glu  
 3845 3850 3855  
 Pro Pro Met His Ser Tyr Leu Thr Ser Val Ala Glu Glu Val Leu Ser  
 3860 3865 3870  
 Leu Lys Glu Lys Thr Val Ser Asp Thr Asn Arg Glu Gln Arg Val Thr  
 3875 3880 3885  
 Leu Gln Lys Gln Glu Ala Gln Ser Ala Leu Ile Leu Ser Gln Ser Leu



|      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |     |      |
|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|------|
| 3890 | Ala | Glu | Gly | His | Val  | Glu | Ser | Leu | Gln | Ser  | Pro | Asp | Val | Met | Ile | Ser  |
| 3905 | Gln | Val | Asn | Tyr | Glu  | Pro | Leu | Val | Pro | Ser  | Glu | His | Ser | Cys | Thr | Glu  |
|      |     |     |     |     | 3925 |     |     |     |     | 3930 |     |     |     |     |     | 3935 |
|      | Gly | Gly | Lys | Ile | Leu  | Ile | Glu | Ser | Ala | Asn  | Pro | Leu | Glu | Asn | Ala | Gly  |
|      |     |     |     |     | 3940 |     |     |     |     | 3945 |     |     |     |     |     | 3950 |
|      | Gln | Asp | Ser | Ala | Val  | Arg | Ile | Glu | Gly | Lys  | Ser | Leu | Arg | Phe | Pro |      |
|      |     |     |     |     | 3955 |     |     |     |     | 3960 |     |     |     |     |     | 3965 |
|      | Leu | Ala | Leu | Glu | Glu  | Lys | Gln | Val | Leu | Leu  | Lys | Glu | Glu | His | Ser | Asp  |
|      |     |     |     |     | 3970 |     |     |     |     | 3975 |     |     |     |     |     | 3980 |
|      | Asn | Val | Val | Met | Pro  | Pro | Asp | Gln | Ile | Ile  | Glu | Ser | Lys | Arg | Glu | Pro  |
|      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |     | 4000 |
|      | Val | Ala | Ile | Lys | Lys  | Val | Gln | Glu | Val | Gln  | Gly | Arg | Asp | Leu | Leu | Ser  |
|      |     |     |     |     | 4005 |     |     |     |     | 4010 |     |     |     |     |     | 4015 |
|      | Lys | Glu | Ser | Leu | Leu  | Ser | Gly | Ile | Pro | Glu  | Glu | Gln | Arg | Leu | Asn | Leu  |
|      |     |     |     |     | 4020 |     |     |     |     | 4025 |     |     |     |     |     | 4030 |
|      | Lys | Ile | Gln | Ile | Cys  | Arg | Ala | Leu | Gln | Ala  | Ala | Val | Ala | Ser | Glu | Gln  |
|      |     |     |     |     | 4035 |     |     |     |     | 4040 |     |     |     |     |     | 4045 |
|      | Pro | Gly | Leu | Phe | Ser  | Glu | Trp | Leu | Arg | Asn  | Ile | Glu | Lys | Val | Glu | Val  |
|      |     |     |     |     | 4050 |     |     |     |     | 4055 |     |     |     |     |     | 4060 |
|      | Glu | Ala | Val | Asn | Ile  | Thr | Gln | Glu | Pro | Arg  | His | Ile | Met | Cys | Met | Tyr  |
|      |     |     |     |     |      |     |     |     |     |      |     |     |     |     |     | 4080 |
|      | Leu | Val | Thr | Ser | Ala  | Lys | Ser | Val | Thr | Glu  | Glu | Val | Thr | Ile | Ile | Ile  |
|      |     |     |     |     | 4085 |     |     |     |     | 4090 |     |     |     |     |     | 4095 |
|      | Glu | Asp | Val | Asp | Pro  | Gln | Met | Ala | Asn | Leu  | Lys | Met | Glu | Leu | Arg | Asp  |
|      |     |     |     |     | 4100 |     |     |     |     | 4105 |     |     |     |     |     | 4110 |
|      | Ala | Leu | Cys | Ala | Ile  | Ile | Tyr | Glu | Glu | Ile  | Asp | Ile | Leu | Thr | Ala | Glu  |
|      |     |     |     |     | 4115 |     |     |     |     | 4120 |     |     |     |     |     | 4125 |
|      | Gly | Pro | Arg | Ile | Gln  | Gln | Gly | Ala | Lys | Thr  | Ser | Leu | Gln | Glu | Glu | Met  |
|      |     |     |     |     |      |     |     |     |     | 4135 |     |     |     |     |     | 4140 |
|      | Asp | Ser | Phe | Ser | Gly  | Ser | Gln | Lys | Val | Glu  | Pro | Ile | Thr | Glu | Pro | Glu  |
|      |     |     |     |     |      |     |     |     |     | 4150 |     |     |     |     |     | 4160 |
|      | Val | Glu | Ser | Lys | Tyr  | Leu | Ile | Ser | Thr | Glu  | Glu | Val | Ser | Tyr | Phe | Asn  |
|      |     |     |     |     | 4165 |     |     |     |     | 4170 |     |     |     |     |     | 4175 |
|      | Val | Gln | Ser | Arg | Val  | Lys | Tyr | Leu | Asp | Ala  | Thr | Pro | Val | Thr | Lys | Gly  |
|      |     |     |     |     | 4180 |     |     |     |     | 4185 |     |     |     |     |     | 4190 |
|      | Val | Ala | Ser | Ala | Val  | Val | Ser | Asp | Glu | Lys  | Gln | Asp | Glu | Ser | Leu | Lys  |
|      |     |     |     |     | 4195 |     |     |     |     | 4200 |     |     |     |     |     | 4205 |
|      | Pro | Ser | Glu | Glu | Lys  | Glu | Glu | Ser | Ser | Ser  | Glu | Ser | Gly | Thr | Glu | Glu  |
|      |     |     |     |     |      |     |     |     |     | 4215 |     |     |     |     |     | 4220 |
|      | Val | Ala | Thr | Val | Lys  | Ile | Gln | Glu | Ala | Glu  | Gly | Gly | Leu | Ile | Lys | Glu  |
|      |     |     |     |     |      |     |     |     |     | 4230 |     |     |     |     |     | 4240 |
|      | Asp | Gly | Pro | Met | Ile  | His | Thr | Pro | Leu | Val  | Asp | Thr | Val | Ser | Glu | Glu  |
|      |     |     |     |     | 4245 |     |     |     |     | 4250 |     |     |     |     |     | 4255 |
|      | Gly | Asp | Ile | Val | His  | Leu | Thr | Thr | Ser | Ile  | Thr | Asn | Ala | Lys | Glu | Val  |
|      |     |     |     |     | 4260 |     |     |     |     | 4265 |     |     |     |     |     | 4270 |
|      | Asn | Trp | Tyr | Phe | Glu  | Asn | Lys | Leu | Val | Pro  | Ser | Asp | Glu | Lys | Phe | Lys  |
|      |     |     |     |     | 4275 |     |     |     |     | 4280 |     |     |     |     |     | 4285 |
|      | Cys | Leu | Gln | Asp | Gln  | Asn | Thr | Tyr | Thr | Leu  | Val | Ile | Asp | Lys | Val | Asn  |
|      |     |     |     |     |      |     |     |     |     | 4295 |     |     |     |     |     | 4300 |
|      | Thr | Glu | Asp | His | Gln  | Gly | Glu | Tyr | Val | Cys  | Glu | Ala | Leu | Asn | Asp | Ser  |
|      |     |     |     |     |      |     |     |     |     | 4310 |     |     |     |     |     | 4320 |
|      | Gly | Lys | Thr | Ala | Thr  | Ser | Ala | Lys | Leu | Thr  | Val | Val | Lys | Arg | Ala | Ala  |
|      |     |     |     |     | 4325 |     |     |     |     | 4330 |     |     |     |     |     | 4335 |
|      | Pro | Val | Ile | Lys | Arg  | Lys | Ile | Glu | Pro | Leu  | Glu | Val | Ala | Leu | Gly | His  |
|      |     |     |     |     | 4340 |     |     |     |     | 4345 |     |     |     |     |     | 4350 |
|      | Leu | Ala | Lys | Phe | Thr  | Cys | Glu | Ile | Gln | Ser  | Ala | Pro | Asn | Val | Arg | Phe  |
|      |     |     |     |     | 4355 |     |     |     |     | 4360 |     |     |     |     |     | 4365 |

Gln Trp Phe Lys Ala Gly Arg Glu Ile Tyr Glu Ser Asp Lys Cys Ser  
 4370 4375 4380  
 Ile Arg Ser Ser Lys Tyr Ile Ser Ser Leu Glu Ile Leu Arg Thr Gln  
 4385 4390 4395 4400  
 Val Val Asp Cys Gly Glu Tyr Thr Cys Lys Ala Ser Asn Glu Tyr Gly  
 4405 4410 4415  
 Ser Val Ser Cys Thr Ala Thr Leu Thr Val Thr Val Pro Gly Gly Glu  
 4420 4425 4430  
 Lys Lys Val Arg Lys Leu Leu Pro Glu Arg Lys Pro Glu Pro Lys Glu  
 4435 4440 4445  
 Glu Val Val Leu Lys Ser Val Leu Arg Lys Arg Pro Glu Glu Glu Glu  
 4450 4455 4460  
 Pro Lys Val Glu Pro Lys Lys Leu Glu Lys Val Lys Lys Pro Ala Val  
 4465 4470 4475 4480  
 Pro Glu Pro Pro Pro Pro Lys Pro Val Glu Glu Val Glu Val Pro Thr  
 4485 4490 4495  
 Val Thr Lys Arg Glu Arg Lys Ile Pro Glu Pro Thr Lys Val Pro Glu  
 4500 4505 4510  
 Ile Lys Pro Ala Ile Pro Leu Pro Ala Pro Glu Pro Lys Pro Lys Pro  
 4515 4520 4525  
 Glu Ala Glu Val Lys Thr Ile Lys Pro Pro Pro Val Glu Pro Glu Pro  
 4530 4535 4540  
 Thr Pro Ile Ala Ala Pro Val Thr Val Pro Val Val Gly Lys Lys Ala  
 4545 4550 4555 4560  
 Glu Ala Lys Ala Pro Lys Glu Glu Ala Ala Lys Pro Lys Gly Pro Ile  
 4565 4570 4575  
 Lys Gly Val Pro Lys Lys Thr Pro Ser Pro Ile Glu Ala Glu Arg Arg  
 4580 4585 4590  
 Lys Leu Arg Pro Gly Ser Gly Gly Glu Lys Pro Pro Asp Glu Ala Pro  
 4595 4600 4605  
 Phe Thr Tyr Gln Leu Lys Ala Val Pro Leu Lys Phe Val Lys Glu Ile  
 4610 4615 4620  
 Lys Asp Ile Ile Leu Thr Glu Ser Glu Phe Val Gly Ser Ser Ala Ile  
 4625 4630 4635 4640  
 Phe Glu Cys Leu Val Ser Pro Ser Thr Ala Ile Thr Thr Trp Met Lys  
 4645 4650 4655  
 Asp Gly Ser Asn Ile Arg Glu Ser Pro Lys His Arg Phe Ile Ala Asp  
 4660 4665 4670  
 Gly Lys Asp Arg Lys Leu His Ile Ile Asp Val Gln Leu Ser Asp Ala  
 4675 4680 4685  
 Gly Glu Tyr Thr Cys Val Leu Arg Leu Gly Asn Lys Glu Lys Thr Ser  
 4690 4695 4700  
 Thr Ala Lys Leu Val Val Glu Glu Leu Pro Val Arg Phe Val Lys Thr  
 4705 4710 4715 4720  
 Leu Glu Glu Glu Val Thr Val Val Lys Gly Gln Pro Leu Tyr Leu Ser  
 4725 4730 4735  
 Cys Glu Leu Asn Lys Glu Arg Asp Val Val Trp Arg Lys Asp Gly Lys  
 4740 4745 4750  
 Ile Val Val Glu Lys Pro Gly Arg Ile Val Pro Gly Val Ile Gly Leu  
 4755 4760 4765  
 Met Arg Ala Leu Thr Ile Asn Asp Ala Asp Asp Thr Asp Ala Gly Thr  
 4770 4775 4780  
 Tyr Thr Val Thr Val Glu Asn Ala Asn Asn Leu Glu Cys Ser Ser Cys  
 4785 4790 4795 4800  
 Val Lys Val Val Glu Val Ile Arg Asp Trp Leu Val Lys Pro Ile Arg  
 4805 4810 4815  
 Asp Gln His Val Lys Pro Lys Gly Thr Ala Ile Phe Ala Cys Asp Ile  
 4820 4825 4830  
 Ala Lys Asp Thr Pro Asn Ile Lys Trp Phe Lys Gly Tyr Asp Glu Ile

|   |      |      |
|---|------|------|
| 4835  | 4840 | 4845 |
| Pro Ala Glu Pro Asn Asp Lys Thr Glu Ile Leu Arg Asp Gly Asn His |      |      |
| 4850  | 4855 | 4860 |
| Leu Tyr Leu Lys Ile Lys Asn Ala Met Pro Glu Asp Ile Ala Glu Tyr |      |      |
| 4865  | 4870 | 4875 |
| Ala Val Glu Ile Glu Gly Lys Arg Tyr Pro Ala Lys Leu Thr Leu Gly |      | 4880 |
| 4885  | 4890 | 4895 |
| Glu Arg Glu Val Glu Leu Leu Lys Pro Ile Glu Asp Val Thr Ile Tyr |      |      |
| 4900  | 4905 | 4910 |
| Glu Lys Glu Ser Ala Ser Phe Asp Ala Glu Ile Ser Glu Ala Asp Ile |      |      |
| 4915  | 4920 | 4925 |
| Pro Gly Gln Trp Lys Leu Lys Gly Glu Leu Leu Arg Pro Ser Pro Thr |      |      |
| 4930  | 4935 | 4940 |
| Cys Glu Ile Lys Ala Glu Gly Gly Lys Arg Phe Leu Thr Leu His Lys |      |      |
| 4945  | 4950 | 4955 |
| Val Lys Leu Asp Gln Ala Gly Glu Val Leu Tyr Gln Ala Leu Asn Ala |      | 4960 |
| 4965  | 4970 | 4975 |
| Ile Thr Thr Ala Ile Leu Thr Val Lys Glu Ile Glu Leu Asp Phe Ala |      |      |
| 4980  | 4985 | 4990 |
| Val Pro Leu Lys Asp Val Thr Val Pro Glu Arg Arg Gln Ala Arg Phe |      |      |
| 4995  | 5000 | 5005 |
| Glu Cys Val Leu Thr Arg Glu Ala Asn Val Ile Trp Ser Lys Gly Pro |      |      |
| 5010  | 5015 | 5020 |
| Asp Ile Ile Lys Ser Ser Asp Lys Phe Asp Ile Ile Ala Asp Gly Lys |      |      |
| 5025  | 5030 | 5035 |
| Lys His Ile Leu Val Ile Asn Asp Ser Gln Phe Asp Asp Glu Gly Val |      |      |
| 5045  | 5050 | 5055 |
| Tyr Thr Ala Glu Val Glu Gly Lys Lys Thr Ser Ala Arg Leu Phe Val |      |      |
| 5060  | 5065 | 5070 |
| Thr Gly Ile Arg Leu Lys Phe Met Ser Pro Leu Glu Asp Gln Thr Val |      |      |
| 5075  | 5080 | 5085 |
| Lys Glu Gly Glu Thr Ala Thr Phe Val Cys Glu Leu Ser His Glu Lys |      |      |
| 5090  | 5095 | 5100 |
| Met His Val Val Trp Phe Lys Asn Asp Ala Lys Leu His Thr Ser Arg |      |      |
| 5105  | 5110 | 5115 |
| Thr Val Leu Ile Ser Ser Glu Gly Lys Thr His Lys Leu Glu Met Lys |      |      |
| 5125  | 5130 | 5135 |
| Glu Val Thr Leu Asp Asp Ile Ser Gln Ile Lys Ala Gln Val Lys Glu |      |      |
| 5140  | 5145 | 5150 |
| Leu Ser Ser Thr Ala Gln Leu Lys Val Leu Glu Ala Asp Pro Tyr Phe |      |      |
| 5155  | 5160 | 5165 |
| Thr Val Lys Leu His Asp Lys Thr Ala Val Glu Lys Asp Glu Ile Thr |      |      |
| 5170  | 5175 | 5180 |
| Leu Lys Cys Glu Val Ser Lys Asp Val Pro Val Lys Trp Phe Lys Asp |      |      |
| 5185  | 5190 | 5195 |
| Gly Glu Glu Ile Val Pro Ser Pro Lys Tyr Ser Ile Lys Ala Asp Gly |      |      |
| 5205  | 5210 | 5215 |
| Leu Arg Arg Ile Leu Lys Ile Lys Lys Ala Asp Leu Lys Asp Lys Gly |      |      |
| 5220  | 5225 | 5230 |
| Glu Tyr Val Cys Asp Cys Gly Thr Asp Lys Thr Lys Ala Asn Val Thr |      |      |
| 5235  | 5240 | 5245 |
| Val Glu Ala Arg Leu Ile Glu Val Glu Lys Pro Leu Tyr Gly Val Glu |      |      |
| 5250  | 5255 | 5260 |
| Val Phe Val Gly Glu Thr Ala His Phe Glu Ile Glu Leu Ser Glu Pro |      |      |
| 5265  | 5270 | 5275 |
| Asp Val His Gly Gln Trp Lys Leu Lys Gly Gln Pro Leu Thr Ala Ser |      |      |
| 5285  | 5290 | 5295 |
| Pro Asp Cys Glu Ile Ile Glu Asp Gly Lys Lys His Ile Leu Ile Leu |      |      |
| 5300  | 5305 | 5310 |

His Asn Cys Gln Leu Gly Met Thr Gly Glu Val Ser Phe Gln Ala Ala  
 5315 5320 5325  
 Asn Ala Lys Ser Ala Ala Asn Leu Lys Val Lys Glu Leu Pro Leu Ile  
 5330 5335 5340  
 Phe Ile Thr Pro Leu Ser Asp Val Lys Val Phe Glu Lys Asp Glu Ala  
 5345 5350 5355 5360  
 Lys Phe Glu Cys Glu Val Ser Arg Glu Pro Lys Thr Phe Arg Trp Leu  
 5365 5370 5375  
 Lys Gly Thr Gln Glu Ile Thr Gly Asp Asp Arg Phe Glu Leu Ile Lys  
 5380 5385 5390  
 Asp Gly Thr Lys His Ser Met Val Ile Lys Ser Ala Ala Phe Glu Asp  
 5395 5400 5405  
 Glu Ala Lys Tyr Met Phe Glu Ala Glu Asp Lys His Thr Ser Gly Lys  
 5410 5415 5420  
 Leu Ile Ile Glu Gly Ile Arg Leu Lys Phe Leu Thr Pro Leu Lys Asp  
 5425 5430 5435 5440  
 Val Thr Ala Lys Glu Lys Glu Ser Ala Val Phe Thr Val Glu Leu Ser  
 5445 5450 5455  
 His Asp Asn Ile Arg Val Lys Trp Phe Lys Asn Asp Gln Arg Leu His  
 5460 5465 5470  
 Thr Thr Arg Ser Val Ser Met Gln Asp Glu Gly Lys Thr His Ser Ile  
 5475 5480 5485  
 Thr Phe Lys Asp Leu Ser Ile Asp Asp Thr Ser Gln Ile Arg Val Glu  
 5490 5495 5500  
 Ala Met Gly Met Ser Ser Glu Ala Lys Leu Thr Val Leu Glu Gly Asp  
 5505 5510 5515 5520  
 Pro Tyr Phe Thr Gly Lys Leu Gln Asp Tyr Thr Gly Val Glu Lys Asp  
 5525 5530 5535  
 Glu Val Ile Leu Gln Cys Glu Ile Ser Lys Ala Asp Ala Pro Val Lys  
 5540 5545 5550  
 Trp Phe Lys Asp Gly Lys Glu Ile Lys Pro Ser Lys Asn Ala Val Ile  
 5555 5560 5565  
 Lys Thr Asp Gly Lys Lys Arg Met Leu Ile Leu Lys Lys Ala Leu Lys  
 5570 5575 5580  
 Ser Asp Ile Gly Gln Tyr Thr Cys Asp Cys Gly Thr Asp Lys Thr Ser  
 5585 5590 5595 5600  
 Gly Lys Leu Asp Ile Glu Asp Arg Glu Ile Lys Leu Val Arg Pro Leu  
 5605 5610 5615  
 His Ser Val Glu Val Met Glu Thr Glu Thr Ala Arg Phe Glu Thr Glu  
 5620 5625 5630  
 Ile Ser Glu Asp Asp Ile His Ala Asn Trp Lys Leu Lys Gly Glu Ala  
 5635 5640 5645  
 Leu Leu Gln Thr Pro Asp Cys Glu Ile Lys Glu Glu Gly Lys Ile His  
 5650 5655 5660  
 Ser Leu Val Leu His Asn Cys Arg Leu Asp Gln Thr Gly Gly Val Asp  
 5665 5670 5675 5680  
 Phe Gln Ala Ala Asn Val Lys Ser Ser Ala His Leu Arg Val Lys Pro  
 5685 5690 5695  
 Arg Val Ile Gly Leu Leu Arg Pro Leu Lys Asp Val Thr Val Thr Ala  
 5700 5705 5710  
 Gly Glu Thr Ala Thr Phe Asp Cys Glu Leu Ser Tyr Glu Asp Ile Pro  
 5715 5720 5725  
 Val Glu Trp Tyr Leu Lys Gly Lys Lys Leu Glu Pro Ser Asp Lys Val  
 5730 5735 5740  
 Val Pro Arg Ser Glu Gly Lys Val His Thr Leu Thr Leu Arg Asp Val  
 5745 5750 5755 5760  
 Lys Leu Glu Asp Ala Gly Glu Val Gln Leu Thr Ala Lys Asp Phe Lys  
 5765 5770 5775  
 Thr His Ala Asn Leu Phe Val Lys Glu Pro Pro Val Glu Phe Thr Lys

| 5780 |     |     |     |      | 5785 |      |      |     |      | 5790 |      |      |     |      |
|------|-----|-----|-----|------|------|------|------|-----|------|------|------|------|-----|------|
| Pro  | Leu | Glu | Asp | Gln  | Thr  | Val  | Glu  | Gly | Ala  | Thr  | Ala  | Val  | Leu | Glu  |
| 5795 |     |     |     |      |      |      | 5800 |     |      |      |      | 5805 |     |      |
| Cys  | Glu | Val | Ser | Arg  | Glu  | Asn  | Ala  | Lys | Val  | Lys  | Trp  | Phe  | Lys | Asn  |
| 5810 |     |     |     |      |      | 5815 |      |     |      |      | 5820 |      |     |      |
| Thr  | Glu | Ile | Leu | Lys  | Ser  | Lys  | Lys  | Tyr | Glu  | Ile  | Val  | Ala  | Asp | Gly  |
| 5825 |     |     |     |      | 5830 |      |      |     |      | 5835 |      |      |     | 5840 |
| Val  | Arg | Lys | Leu | Val  | Ile  | His  | Asp  | Cys | Thr  | Pro  | Glu  | Asp  | Ile | Lys  |
|      |     |     |     | 5845 |      |      |      |     | 5850 |      |      |      |     | 5855 |
| Tyr  | Thr | Cys | Asp | Ala  | Lys  | Asp  | Phe  | Lys | Thr  | Ser  | Cys  | Asn  | Leu | Asn  |
|      |     |     |     | 5860 |      |      |      |     | 5865 |      |      |      |     | 5870 |
| Val  | Pro | Pro | His | Val  | Glu  | Phe  | Leu  | Arg | Pro  | Leu  | Thr  | Asp  | Leu | Gln  |
|      |     |     |     | 5875 |      |      |      |     | 5880 |      |      |      |     | 5885 |
| Arg  | Glu | Lys | Glu | Met  | Ala  | Arg  | Phe  | Glu | Cys  | Glu  | Leu  | Ser  | Arg | Glu  |
|      |     |     |     | 5890 |      |      |      |     | 5895 |      |      |      |     | 5900 |
| Ala  | Lys | Val | Lys | Trp  | Phe  | Lys  | Asp  | Gly | Ala  | Glu  | Ile  | Lys  | Lys | Gly  |
| 5905 |     |     |     |      |      | 5910 |      |     |      |      | 5915 |      |     | 5920 |
| Lys  | Tyr | Asp | Ile | Ile  | Ser  | Lys  | Gly  | Ala | Val  | Arg  | Ile  | Leu  | Val | Ile  |
|      |     |     |     | 5925 |      |      |      |     | 5930 |      |      |      |     | 5935 |
| Lys  | Cys | Leu | Leu | Asp  | Asp  | Glu  | Ala  | Glu | Tyr  | Ser  | Cys  | Glu  | Val | Arg  |
|      |     |     |     | 5940 |      |      |      |     | 5945 |      |      |      |     | 5950 |
| Ala  | Arg | Thr | Ser | Gly  | Met  | Leu  | Thr  | Val | Leu  | Glu  | Glu  | Glu  | Ala | Val  |
|      |     |     |     | 5955 |      |      |      |     | 5960 |      |      |      |     | 5965 |
| Thr  | Lys | Asn | Leu | Ala  | Asn  | Ile  | Glu  | Val | Ser  | Glu  | Thr  | Asp  | Thr | Ile  |
|      |     |     |     | 5970 |      |      |      |     | 5975 |      |      |      |     | 5980 |
| Leu  | Val | Cys | Glu | Val  | Ser  | Lys  | Pro  | Gly | Ala  | Glu  | Val  | Ile  | Trp | Tyr  |
| 5985 |     |     |     |      |      | 5990 |      |     |      |      | 5995 |      |     | 6000 |
| Gly  | Asp | Glu | Glu | Ile  | Ile  | Glu  | Thr  | Gly | Arg  | Tyr  | Glu  | Ile  | Leu | Thr  |
|      |     |     |     | 6005 |      |      |      |     | 6010 |      |      |      |     | 6015 |
| Gly  | Arg | Lys | Arg | Ile  | Leu  | Val  | Ile  | Gln | Asn  | Ala  | His  | Leu  | Glu | Asp  |
|      |     |     |     | 6020 |      |      |      |     | 6025 |      |      |      |     | 6030 |
| Gly  | Asn | Tyr | Asn | Cys  | Arg  | Leu  | Pro  | Ser | Ser  | Arg  | Thr  | Asp  | Gly | Lys  |
|      |     |     |     | 6035 |      |      |      |     | 6040 |      |      |      |     | 6045 |
| Lys  | Val | His | Glu | Leu  | Ala  | Ala  | Glu  | Phe | Ile  | Ser  | Lys  | Pro  | Gln | Asn  |
|      |     |     |     | 6050 |      |      |      |     | 6055 |      |      |      |     | 6060 |
| Glu  | Ile | Leu | Glu | Gly  | Glu  | Lys  | Ala  | Glu | Phe  | Val  | Cys  | Ser  | Ile | Ser  |
| 6065 |     |     |     |      |      | 6070 |      |     |      |      | 6075 |      |     | 6080 |
| Glu  | Ser | Phe | Pro | Val  | Gln  | Trp  | Lys  | Arg | Asp  | Asp  | Lys  | Thr  | Leu | Glu  |
|      |     |     |     | 6085 |      |      |      |     | 6090 |      |      |      |     | 6095 |
| Gly  | Asp | Lys | Tyr | Asp  | Val  | Ile  | Ala  | Asp | Gly  | Lys  | Lys  | Arg  | Val | Leu  |
|      |     |     |     | 6100 |      |      |      |     | 6105 |      |      |      |     | 6110 |
| Val  | Lys | Asp | Ala | Thr  | Leu  | Gln  | Asp  | Met | Gly  | Thr  | Tyr  | Val  | Val | Met  |
|      |     |     |     | 6115 |      |      |      |     | 6120 |      |      |      |     | 6125 |
| Gly  | Ala | Ala | Arg | Ala  | Ala  | Ala  | His  | Leu | Thr  | Val  | Ile  | Glu  | Lys | Leu  |
|      |     |     |     | 6130 |      |      |      |     | 6135 |      |      |      |     | 6140 |
| Ile  | Val | Val | Pro | Leu  | Lys  | Asp  | Thr  | Arg | Val  | Lys  | Glu  | Gln  | Gln | Glu  |
| 6145 |     |     |     |      |      | 6150 |      |     |      |      | 6155 |      |     | 6160 |
| Val  | Phe | Asn | Cys | Glu  | Val  | Asn  | Thr  | Glu | Gly  | Ala  | Lys  | Ala  | Lys | Trp  |
|      |     |     |     | 6165 |      |      |      |     | 6170 |      |      |      |     | 6175 |
| Arg  | Asn | Glu | Glu | Ala  | Ile  | Phe  | Asp  | Ser | Ser  | Lys  | Tyr  | Ile  | Ile | Leu  |
|      |     |     |     | 6180 |      |      |      |     | 6185 |      |      |      |     | 6190 |
| Lys  | Asp | Leu | Val | Tyr  | Thr  | Leu  | Arg  | Ile | Arg  | Asp  | Ala  | His  | Leu | Asp  |
|      |     |     |     | 6195 |      |      |      |     | 6200 |      |      |      |     | 6205 |
| Gln  | Ala | Asn | Tyr | Asn  | Val  | Ser  | Leu  | Thr | Asn  | His  | Arg  | Gly  | Glu | Asn  |
|      |     |     |     | 6210 |      |      |      |     | 6215 |      |      |      |     | 6220 |
| Lys  | Ser | Ala | Ala | Asn  | Leu  | Ile  | Val  | Glu | Glu  | Glu  | Asp  | Leu  | Arg | Ile  |
| 6225 |     |     |     |      |      | 6230 |      |     |      |      | 6235 |      |     | 6240 |
| Glu  | Pro | Leu | Lys | Asp  | Ile  | Glu  | Thr  | Met | Glu  | Lys  | Lys  | Ser  | Val | Thr  |
|      |     |     |     | 6245 |      |      |      |     | 6250 |      |      |      |     | 6255 |

Trp Cys Lys Val Asn Arg Leu Asn Val Thr Leu Lys Trp Thr Lys Asn  
 6260 6265 6270  
 Gly Glu Glu Val Pro Phe Asp Asn Arg Val Ser Tyr Arg Val Asp Lys  
 6275 6280 6285  
 Tyr Lys His Met Leu Thr Ile Lys Asp Cys Gly Phe Pro Asp Glu Gly  
 6290 6295 6300  
 Glu Tyr Ile Val Thr Ala Gly Gln Asp Lys Ser Val Ala Glu Leu Leu  
 6305 6310 6315 6320  
 Ile Ile Glu Ala Pro Thr Glu Phe Val Glu His Leu Glu Asp Gln Thr  
 6325 6330 6335  
 Val Thr Glu Phe Asp Asp Ala Val Phe Ser Cys Gln Leu Ser Arg Glu  
 6340 6345 6350  
 Lys Ala Asn Val Lys Trp Tyr Arg Asn Gly Arg Glu Ile Lys Glu Gly  
 6355 6360 6365  
 Lys Lys Tyr Lys Phe Glu Lys Asp Gly Ser Ile His Arg Leu Ile Ile  
 6370 6375 6380  
 Lys Asp Cys Arg Leu Asp Asp Glu Cys Glu Tyr Ala Cys Gly Val Glu  
 6385 6390 6395 6400  
 Asp Arg Lys Ser Arg Ala Arg Leu Phe Val Glu Glu Ile Pro Val Glu  
 6405 6410 6415  
 Ile Ile Arg Pro Pro Gln Asp Ile Leu Glu Ala Pro Gly Ala Asp Val  
 6420 6425 6430  
 Val Phe Leu Ala Glu Leu Asn Lys Asp Lys Val Glu Val Gln Trp Leu  
 6435 6440 6445  
 Arg Asn Asn Met Val Val Val Gln Gly Asp Lys His Gln Met Met Ser  
 6450 6455 6460  
 Glu Gly Lys Ile His Arg Leu Gln Ile Cys Asp Ile Lys Pro Arg Asp  
 6465 6470 6475 6480  
 Gln Gly Glu Tyr Arg Phe Ile Ala Lys Asp Lys Glu Ala Arg Ala Lys  
 6485 6490 6495  
 Leu Glu Leu Ala Ala Ala Pro Lys Ile Lys Thr Ala Asp Gln Asp Leu  
 6500 6505 6510  
 Val Val Asp Val Gly Lys Pro Leu Thr Met Val Val Pro Tyr Asp Ala  
 6515 6520 6525  
 Tyr Pro Lys Ala Glu Ala Glu Trp Phe Lys Glu Asn Glu Pro Leu Ser  
 6530 6535 6540  
 Thr Lys Thr Ile Asp Thr Thr Ala Glu Gln Thr Ser Phe Arg Ile Leu  
 6545 6550 6555 6560  
 Glu Ala Lys Lys Gly Asp Lys Gly Arg Tyr Lys Ile Val Leu Gln Asn  
 6565 6570 6575  
 Lys His Gly Lys Ala Glu Gly Phe Ile Asn Leu Lys Val Ile Asp Val  
 6580 6585 6590  
 Pro Gly Pro Val Arg Asn Leu Glu Val Thr Glu Thr Phe Asp Gly Glu  
 6595 6600 6605  
 Val Ser Leu Ala Trp Glu Glu Pro Leu Thr Asp Gly Gly Ser Lys Ile  
 6610 6615 6620  
 Ile Gly Tyr Val Val Glu Arg Arg Asp Ile Lys Arg Lys Thr Trp Val  
 6625 6630 6635 6640  
 Leu Ala Thr Asp Arg Ala Glu Ser Cys Glu Phe Thr Val Thr Gly Leu  
 6645 6650 6655  
 Gln Lys Gly Gly Val Glu Tyr Leu Phe Arg Val Ser Ala Arg Asn Arg  
 6660 6665 6670  
 Val Gly Thr Gly Glu Pro Val Glu Thr Asp Asn Pro Val Glu Ala Arg  
 6675 6680 6685  
 Ser Lys Tyr Asp Val Pro Gly Pro Pro Leu Asn Val Thr Ile Thr Asp  
 6690 6695 6700  
 Val Asn Arg Phe Gly Val Ser Leu Thr Trp Glu Pro Pro Glu Tyr Asp  
 6705 6710 6715 6720  
 Gly Gly Ala Glu Ile Thr Asn Tyr Val Ile Glu Leu Arg Asp Lys Thr



Ala Gly Leu Thr Val Lys Ala Gly Thr Lys Ile Glu Leu Pro Ala Thr  
 7205 7210 7215  
 Val Thr Gly Lys Pro Glu Pro Lys Ile Thr Trp Thr Lys Ala Asp Met  
 7220 7225 7230  
 Ile Leu Lys Gln Asp Lys Arg Ile Thr Ile Glu Asn Val Pro Lys Lys  
 7235 7240 7245  
 Ser Thr Val Thr Ile Val Asp Ser Lys Arg Ser Asp Thr Gly Thr Tyr  
 7250 7255 7260  
 Ile Ile Glu Ala Val Asn Val Cys Gly Arg Ala Thr Ala Val Val Glu  
 7265 7270 7275 7280  
 Val Asn Val Leu Asp Lys Pro Gly Pro Pro Ala Ala Phe Asp Ile Thr  
 7285 7290 7295  
 Asp Val Thr Asn Glu Ser Cys Leu Leu Thr Trp Asn Pro Pro Arg Asp  
 7300 7305 7310  
 Asp Gly Gly Ser Lys Ile Thr Asn Tyr Val Val Glu Arg Arg Ala Thr  
 7315 7320 7325  
 Asp Ser Glu Val Trp His Lys Leu Ser Ser Thr Val Lys Asp Thr Asn  
 7330 7335 7340  
 Phe Lys Ala Thr Lys Leu Ile Pro Asn Lys Glu Tyr Ile Phe Arg Val  
 7345 7350 7355 7360  
 Ala Ala Glu Asn Met Tyr Gly Ala Gly Glu Pro Val Gln Ala Ser Pro  
 7365 7370 7375  
 Ile Thr Ala Lys Tyr Gln Phe Asp Pro Pro Gly Pro Pro Thr Arg Leu  
 7380 7385 7390  
 Glu Pro Ser Asp Ile Thr Lys Asp Ala Val Thr Leu Thr Trp Cys Glu  
 7395 7400 7405  
 Pro Asp Asp Asp Gly Gly Ser Pro Ile Thr Gly Tyr Trp Val Glu Arg  
 7410 7415 7420  
 Leu Asp Pro Asp Thr Asp Lys Trp Val Arg Cys Asn Lys Met Pro Val  
 7425 7430 7435 7440  
 Lys Asp Thr Thr Tyr Arg Val Lys Gly Leu Thr Asn Lys Lys Lys Tyr  
 7445 7450 7455  
 Arg Phe Arg Val Leu Ala Glu Asn Leu Ala Gly Pro Gly Lys Pro Ser  
 7460 7465 7470  
 Lys Ser Thr Glu Pro Ile Leu Ile Lys Asp Pro Ile Asp Pro Pro Trp  
 7475 7480 7485  
 Pro Pro Gly Lys Pro Thr Val Lys Asp Val Gly Lys Thr Ser Val Arg  
 7490 7495 7500  
 Leu Asn Trp Thr Lys Pro Glu His Asp Gly Gly Ala Lys Ile Glu Ser  
 7505 7510 7515 7520  
 Tyr Val Ile Glu Met Leu Lys Thr Gly Thr Asp Glu Trp Val Arg Val  
 7525 7530 7535  
 Ala Glu Gly Val Pro Thr Thr Gln His Leu Leu Pro Gly Leu Met Glu  
 7540 7545 7550  
 Gly Gln Glu Tyr Ser Phe Arg Val Arg Ala Val Asn Lys Ala Gly Glu  
 7555 7560 7565  
 Ser Glu Pro Ser Glu Pro Ser Asp Pro Val Leu Cys Arg Glu Lys Leu  
 7570 7575 7580  
 Tyr Pro Pro Ser Pro Pro Arg Trp Leu Glu Val Ile Asn Ile Thr Lys  
 7585 7590 7595 7600  
 Asn Thr Ala Asp Leu Lys Trp Thr Val Pro Glu Lys Asp Gly Gly Ser  
 7605 7610 7615  
 Pro Ile Thr Asn Tyr Ile Val Glu Lys Arg Asp Val Arg Arg Lys Gly  
 7620 7625 7630  
 Trp Gln Thr Val Asp Thr Thr Val Lys Asp Thr Lys Cys Thr Val Thr  
 7635 7640 7645  
 Pro Leu Thr Glu Gly Ser Leu Tyr Val Phe Arg Val Ala Ala Glu Asn  
 7650 7655 7660  
 Ala Ile Gly Gln Ser Asp Tyr Thr Glu Ile Glu Asp Ser Val Leu Ala



|  |      |      |      |      |      |      |
|--|------|------|------|------|------|------|
| 7665   |      | 7670 |      | 7675 |      | 7680 |
| Lys Asp Thr Phe Thr Thr Pro Gly Pro' Pro Tyr Ala Leu Ala Val Val |      |      |      |      |      |      |
|  | 7685 |      | 7690 |      | 7695 |      |
| Asp Val Thr Lys Arg His Val Asp Leu Lys Trp Glu Pro Pro Lys Asn  |      |      |      |      |      |      |
|  | 7700 |      | 7705 |      | 7710 |      |
| Asp Gly Gly Arg Pro Ile Gln Arg Tyr Val Ile Glu Lys Lys Glu Arg  |      |      |      |      |      |      |
|  | 7715 |      | 7720 |      | 7725 |      |
| Leu Gly Thr Arg Trp Val Lys Ala Gly Lys Thr Ala Gly Pro Asp Cys  |      |      |      |      |      |      |
|  | 7730 |      | 7735 |      | 7740 |      |
| Asn Phe Arg Val Thr Asp Val Ile Glu Gly Thr Glu Val Gln Phe Gln  |      |      |      |      |      |      |
|  | 7745 |      | 7750 |      | 7755 | 7760 |
| Val Arg Ala Glu Asn Glu Ala Gly Val Gly His Pro Ser Glu Pro Thr  |      |      |      |      |      |      |
|  | 7765 |      | 7770 |      | 7775 |      |
| Glu Ile Leu Ser Ile Glu Asp Pro Thr Ser Pro Pro Ser Pro Pro Leu  |      |      |      |      |      |      |
|  | 7780 |      | 7785 |      | 7790 |      |
| Asp Leu His Val Thr Asp Ala Gly Arg Lys His Ile Ala Ile Ala Trp  |      |      |      |      |      |      |
|  | 7795 |      | 7800 |      | 7805 |      |
| Lys Pro Pro Glu Lys Asn Gly Gly Ser Pro Ile Ile Gly Tyr His Val  |      |      |      |      |      |      |
|  | 7810 |      | 7815 |      | 7820 |      |
| Glu Met Cys Pro Val Gly Thr Glu Lys Trp Met Arg Val Asn Ser Arg  |      |      |      |      |      |      |
|  | 7825 |      | 7830 |      | 7835 | 7840 |
| Pro Ile Lys Asp Leu Lys Phe Lys Val Glu Glu Gly Val Val Pro Asp  |      |      |      |      |      |      |
|  | 7845 |      | 7850 |      | 7855 |      |
| Lys Glu Tyr Val Leu Arg Val Arg Ala Val Asn Ala Ile Gly Val Ser  |      |      |      |      |      |      |
|  | 7860 |      | 7865 |      | 7870 |      |
| Glu Pro Ser Glu Ile Ser Glu Asn Val Val Ala Lys Asp Pro Asp Cys  |      |      |      |      |      |      |
|  | 7875 |      | 7880 |      | 7885 |      |
| Lys Pro Thr Ile Asp Leu Glu Thr His Asp Ile Ile Val Ile Glu Gly  |      |      |      |      |      |      |
|  | 7890 |      | 7895 |      | 7900 |      |
| Glu Lys Leu Ser Ile Pro Val Pro Phe Arg Ala Val Pro Val Pro Thr  |      |      |      |      |      |      |
|  | 7905 |      | 7910 |      | 7915 | 7920 |
| Val Ser Trp His Lys Asp Gly Lys Glu Val Lys Ala Ser Asp Arg Leu  |      |      |      |      |      |      |
|  | 7925 |      | 7930 |      | 7935 |      |
| Thr Met Lys Asn Asp His Ile Ser Ala His Leu Glu Val Pro Lys Ser  |      |      |      |      |      |      |
|  | 7940 |      | 7945 |      | 7950 |      |
| Val Arg Ala Asp Ala Gly Ile Tyr Thr Ile Thr Leu Glu Asn Lys Leu  |      |      |      |      |      |      |
|  | 7955 |      | 7960 |      | 7965 |      |
| Gly Ser Ala Thr Ala Ser Ile Asn Val Lys Val Ile Gly Leu Pro Gly  |      |      |      |      |      |      |
|  | 7970 |      | 7975 |      | 7980 |      |
| Pro Cys Lys Asp Ile Lys Ala Ser Asp Ile Thr Lys Ser Ser Cys Lys  |      |      |      |      |      |      |
|  | 7985 |      | 7990 |      | 7995 | 8000 |
| Leu Thr Trp Glu Pro Pro Glu Phe Asp Gly Gly Thr Pro Ile Leu His  |      |      |      |      |      |      |
|  | 8005 |      | 8010 |      | 8015 |      |
| Tyr Val Leu Glu Arg Arg Glu Ala Gly Arg Arg Thr Tyr Ile Pro Val  |      |      |      |      |      |      |
|  | 8020 |      | 8025 |      | 8030 |      |
| Met Ser Gly Glu Asn Lys Leu Ser Trp Thr Val Lys Asp Leu Ile Pro  |      |      |      |      |      |      |
|  | 8035 |      | 8040 |      | 8045 |      |
| Asn Gly Glu Tyr Phe Phe Arg Val Lys Ala Val Asn Lys Val Gly Gly  |      |      |      |      |      |      |
|  | 8050 |      | 8055 |      | 8060 |      |
| Gly Glu Tyr Ile Glu Leu Lys Asn Pro Val Ile Ala Gln Asp Pro Lys  |      |      |      |      |      |      |
|  | 8065 |      | 8070 |      | 8075 | 8080 |
| Gln Pro Pro Asp Pro Pro Val Asp Val Glu Val His Asn Pro Thr Ala  |      |      |      |      |      |      |
|  | 8085 |      | 8090 |      | 8095 |      |
| Glu Ala Met Thr Ile Thr Trp Lys Pro Pro Leu Tyr Asp Gly Gly Ser  |      |      |      |      |      |      |
|  | 8100 |      | 8105 |      | 8110 |      |
| Lys Ile Met Gly Tyr Ile Ile Glu Lys Ile Ala Lys Gly Glu Glu Arg  |      |      |      |      |      |      |
|  | 8115 |      | 8120 |      | 8125 |      |
| Trp Lys Arg Cys Asn Glu His Leu Val Pro Ile Leu Thr Tyr Thr Ala  |      |      |      |      |      |      |
|  | 8130 |      | 8135 |      | 8140 |      |

Lys Gly Leu Glu Glu Gly Lys Glu Tyr Gln Phe Arg Val Arg Ala Glu  
 8145 8150 8155 8160  
 Asn Ala Ala Gly Ile Ser Glu Pro Ser Arg Ala Thr Pro Pro Thr Lys  
 8165 8170 8175  
 Ala Val Asp Pro Ile Asp Ala Pro Lys Val Ile Leu Arg Thr Ser Leu  
 8180 8185 8190  
 Glu Val Lys Arg Gly Asp Glu Ile Ala Leu Asp Ala Ser Ile Ser Gly  
 8195 8200 8205  
 Ser Pro Tyr Pro Thr Ile Thr Trp Ile Lys Asp Glu Asn Val Ile Val  
 8210 8215 8220  
 Pro Glu Glu Ile Lys Lys Arg Ala Ala Pro Leu Val Arg Arg Arg Lys  
 8225 8230 8235 8240  
 Gly Glu Val Gln Glu Glu Pro Phe Val Leu Pro Leu Thr Gln Arg  
 8245 8250 8255  
 Leu Ser Ile Asp Asn Ser Lys Lys Gly Glu Ser Gln Leu Arg Val Arg  
 8260 8265 8270  
 Asp Ser Leu Arg Pro Asp His Gly Leu Tyr Met Ile Lys Val Glu Asn  
 8275 8280 8285  
 Asp His Gly Ile Ala Lys Ala Pro Cys Thr Val Ser Val Leu Asp Thr  
 8290 8295 8300  
 Pro Gly Pro Pro Ile Asn Phe Val Phe Glu Asp Ile Arg Lys Thr Ser  
 8305 8310 8315 8320  
 Val Leu Cys Lys Trp Glu Pro Pro Leu Asp Asp Gly Gly Ser Glu Ile  
 8325 8330 8335  
 Ile Asn Tyr Thr Leu Glu Lys Lys Asp Lys Thr Lys Pro Asp Ser Glu  
 8340 8345 8350  
 Trp Ile Val Val Thr Ser Thr Leu Arg His Cys Lys Tyr Ser Val Thr  
 8355 8360 8365  
 Lys Leu Ile Glu Gly Lys Glu Tyr Leu Phe Arg Val Arg Ala Glu Asn  
 8370 8375 8380  
 Arg Phe Gly Pro Gly Pro Pro Cys Val Ser Lys Pro Leu Val Ala Lys  
 8385 8390 8395 8400  
 Asp Pro Phe Gly Pro Pro Asp Ala Pro Asp Lys Pro Ile Val Glu Asp  
 8405 8410 8415  
 Val Thr Ser Asn Ser Met Leu Val Lys Trp Asn Glu Pro Lys Asp Asn  
 8420 8425 8430  
 Gly Ser Pro Ile Leu Gly Tyr Trp Leu Glu Lys Arg Glu Val Asn Ser  
 8435 8440 8445  
 Thr His Trp Ser Arg Val Asn Lys Ser Leu Leu Asn Ala Leu Lys Ala  
 8450 8455 8460  
 Asn Val Asp Gly Leu Leu Glu Gly Leu Thr Tyr Val Phe Arg Val Cys  
 8465 8470 8475 8480  
 Ala Glu Asn Ala Ala Gly Pro Gly Lys Phe Ser Pro Pro Ser Asp Pro  
 8485 8490 8495  
 Lys Thr Ala His Asp Pro Ile Ser Pro Pro Gly Pro Pro Ile Pro Arg  
 8500 8505 8510  
 Val Thr Asp Thr Ser Ser Thr Thr Ile Glu Leu Glu Trp Glu Pro Pro  
 8515 8520 8525  
 Ala Phe Asn Gly Gly Gly Glu Ile Val Gly Tyr Phe Val Asp Lys Gln  
 8530 8535 8540  
 Leu Val Gly Thr Asn Lys Trp Ser Arg Cys Thr Glu Lys Met Ile Lys  
 8545 8550 8555 8560  
 Val Arg Gln Tyr Thr Val Lys Glu Ile Arg Glu Gly Ala Asp Tyr Lys  
 8565 8570 8575  
 Leu Arg Val Ser Ala Val Asn Ala Ala Gly Glu Gly Pro Pro Gly Glu  
 8580 8585 8590  
 Thr Gln Pro Val Thr Val Ala Glu Pro Gln Glu Pro Pro Ala Val Glu  
 8595 8600 8605  
 Leu Asp Val Ser Val Lys Gly Gly Ile Gln Ile Met Ala Gly Lys Thr

|   |      |      |
|---|------|------|
| 8610  | 8615 | 8620 |
| Leu Arg Ile Pro Ala Val Val Thr Gly Arg Pro Val Pro Thr Lys Val |      |      |
| 8625  | 8630 | 8635 |
| Trp Thr Lys Glu Glu Gly Glu Leu Asp Lys Asp Arg Val Val Ile Asp |      | 8640 |
|   | 8645 | 8650 |
| Asn Val Gly Thr Lys Ser Glu Leu Ile Ile Lys Asp Ala Leu Arg Lys |      | 8655 |
|   | 8660 | 8665 |
| Asp His Gly Arg Tyr Val Ile Thr Ala Thr Asn Ser Cys Gly Ser Lys |      | 8670 |
|   | 8675 | 8680 |
| Phe Ala Ala Ala Arg Val Glu Val Phe Asp Val Pro Gly Pro Val Leu |      | 8685 |
|   | 8690 | 8695 |
| Asp Leu Lys Pro Val Val Thr Asn Arg Lys Met Cys Leu Leu Asn Trp |      | 8700 |
| 8705  | 8710 | 8715 |
| Ser Asp Pro Glu Asp Asp Gly Gly Ser Glu Ile Thr Gly Phe Ile Ile |      | 8720 |
|   | 8725 | 8730 |
| Glu Arg Lys Asp Ala Lys Met His Thr Trp Arg Gln Pro Ile Glu Thr |      | 8735 |
|   | 8740 | 8745 |
| Glu Arg Ser Lys Cys Asp Ile Thr Gly Leu Leu Glu Gly Gln Glu Tyr |      | 8750 |
|   | 8755 | 8760 |
| Lys Phe Arg Val Ile Ala Lys Asn Lys Phe Gly Cys Gly Pro Pro Val |      | 8765 |
|   | 8770 | 8775 |
| Glu Ile Gly Pro Ile Leu Ala Val Asp Pro Leu Gly Pro Pro Thr Ser |      | 8780 |
| 8785  | 8790 | 8795 |
| Pro Glu Arg Leu Thr Tyr Thr Glu Arg Gln Arg Ser Thr Ile Thr Leu |      | 8800 |
|   | 8805 | 8810 |
| Asp Trp Lys Glu Pro Arg Ser Asn Gly Gly Ser Pro Ile Gln Gly Tyr |      | 8815 |
|   | 8820 | 8825 |
| Ile Ile Glu Lys Arg Arg His Asp Lys Pro Asp Phe Glu Arg Val Asn |      | 8830 |
|   | 8835 | 8840 |
| Lys Arg Leu Cys Pro Thr Thr Ser Phe Leu Val Glu Asn Leu Asp Glu |      | 8845 |
|   | 8850 | 8855 |
| His Gln Met Tyr Glu Phe Arg Val Lys Ala Val Asn Glu Ile Gly Glu |      | 8860 |
| 8865  | 8870 | 8875 |
| Ser Glu Pro Ser Leu Pro Leu Asn Val Val Ile Gln Asp Asp Glu Val |      | 8880 |
|   | 8885 | 8890 |
| Pro Pro Thr Ile Lys Leu Arg Leu Ser Val Arg Gly Asp Thr Ile Lys |      | 8895 |
|   | 8900 | 8905 |
| Val Lys Ala Gly Glu Pro Val His Ile Pro Ala Asp Val Thr Gly Leu |      | 8910 |
|   | 8915 | 8920 |
| Pro Met Pro Lys Ile Glu Trp Ser Lys Asn Glu Thr Val Ile Glu Lys |      | 8925 |
|   | 8930 | 8935 |
| Pro Thr Asp Ala Leu Gln Ile Thr Lys Glu Glu Val Ser Arg Ser Glu |      | 8940 |
| 8945  | 8950 | 8955 |
| Ala Lys Thr Glu Leu Ser Ile Pro Lys Ala Val Arg Glu Asp Lys Gly |      | 8960 |
|   | 8965 | 8970 |
| Thr Tyr Thr Val Thr Ala Ser Asn Arg Leu Gly Ser Val Phe Arg Asn |      | 8975 |
|   | 8980 | 8985 |
| Val His Val Glu Val Tyr Asp Arg Pro Ser Pro Pro Arg Asn Leu Ala |      | 8990 |
|   | 8995 | 9000 |
| Val Thr Asp Ile Lys Ala Glu Ser Cys Tyr Leu Thr Trp Asp Ala Pro |      | 9005 |
|   | 9010 | 9015 |
| Leu Asp Asn Gly Gly Ser Glu Ile Thr His Tyr Val Ile Asp Lys Arg |      | 9020 |
| 9025  | 9030 | 9035 |
| Asp Ala Ser Arg Lys Lys Ala Glu Trp Glu Glu Val Thr Asn Thr Ala |      | 9040 |
|   | 9045 | 9050 |
| Val Glu Lys Arg Tyr Gly Ile Trp Lys Leu Ile Pro Asn Gly Gln Tyr |      | 9055 |
|   | 9060 | 9065 |
| Glu Phe Arg Val Arg Ala Val Asn Lys Tyr Gly Ile Ser Asp Glu Cys |      | 9070 |
|   | 9075 | 9080 |
|   |      | 9085 |

Lys Ser Asp Lys Val Val Ile Gln Asp Pro Tyr Arg Leu Pro Gly Pro  
 9090 9095 9100  
 Pro Gly Lys Pro Lys Val Leu Ala Arg Thr Lys Gly Ser Met Leu Val  
 9105 9110 9115 9120  
 Ser Trp Thr Pro Pro Leu Asp Asn Gly Gly Ser Pro Ile Thr Gly Tyr  
 9125 9130 9135  
 Trp Leu Glu Lys Arg Glu Glu Gly Ser Pro Tyr Trp Ser Arg Val Ser  
 9140 9145 9150  
 Arg Ala Pro Ile Thr Lys Val Gly Leu Lys Gly Val Glu Phe Asn Val  
 9155 9160 9165  
 Pro Arg Leu Leu Glu Gly Val Lys Tyr Gln Phe Arg Ala Met Ala Ile  
 9170 9175 9180  
 Asn Ala Ala Gly Ile Gly Pro Pro Ser Glu Pro Ser Asp Pro Glu Val  
 9185 9190 9195 9200  
 Ala Gly Asp Pro Ile Phe Pro Pro Gly Pro Pro Ser Cys Pro Glu Val  
 9205 9210 9215  
 Lys Asp Lys Thr Lys Ser Ser Ile Ser Leu Gly Trp Lys Pro Pro Ala  
 9220 9225 9230  
 Lys Asp Gly Gly Ser Pro Ile Lys Gly Tyr Ile Val Glu Met Gln Glu  
 9235 9240 9245  
 Glu Gly Thr Thr Asp Trp Lys Arg Val Asn Glu Pro Asp Lys Leu Ile  
 9250 9255 9260  
 Thr Thr Cys Glu Cys Val Val Pro Asn Leu Lys Glu Leu Arg Lys Tyr  
 9265 9270 9275 9280  
 Arg Phe Arg Val Lys Ala Val Asn Glu Ala Gly Glu Ser Glu Pro Ser  
 9285 9290 9295  
 Asp Thr Thr Gly Glu Ile Pro Ala Thr Asp Ile Gln Glu Glu Pro Glu  
 9300 9305 9310  
 Val Phe Ile Asp Ile Gly Ala Gln Asp Cys Leu Val Cys Lys Ala Gly  
 9315 9320 9325  
 Ser Gln Ile Arg Ile Pro Ala Val Ile Lys Gly Arg Pro Thr Pro Lys  
 9330 9335 9340  
 Ser Ser Trp Glu Phe Asp Gly Lys Ala Lys Lys Ala Met Lys Asp Gly  
 9345 9350 9355 9360  
 Val His Asp Ile Pro Glu Asp Ala Gln Leu Glu Thr Ala Glu Asn Ser  
 9365 9370 9375  
 Ser Val Ile Ile Ile Pro Glu Cys Lys Arg Ser His Thr Gly Lys Tyr  
 9380 9385 9390  
 Ser Ile Thr Ala Lys Asn Lys Ala Gly Gln Lys Thr Ala Asn Cys Arg  
 9395 9400 9405  
 Val Lys Val Met Asp Val Pro Gly Pro Pro Lys Asp Leu Lys Val Ser  
 9410 9415 9420  
 Asp Ile Thr Arg Gly Ser Cys Arg Leu Ser Trp Lys Met Pro Asp Asp  
 9425 9430 9435 9440  
 Asp Gly Gly Asp Arg Ile Lys Gly Tyr Val Ile Glu Lys Arg Thr Ile  
 9445 9450 9455  
 Asp Gly Lys Ala Trp Thr Lys Val Asn Pro Asp Cys Gly Ser Thr Thr  
 9460 9465 9470  
 Phe Val Val Pro Asp Leu Leu Ser Glu Gln Gln Tyr Phe Phe Arg Val  
 9475 9480 9485  
 Arg Ala Glu Asn Arg Phe Gly Ile Gly Pro Pro Val Glu Thr Ile Gln  
 9490 9495 9500  
 Arg Thr Thr Ala Arg Asp Pro Ile Tyr Pro Pro Asp Pro Pro Ile Lys  
 9505 9510 9515 9520  
 Leu Lys Ile Gly Leu Ile Thr Lys Asn Thr Val His Leu Ser Trp Lys  
 9525 9530 9535  
 Pro Pro Lys Asn Asp Gly Gly Ser Pro Val Thr His Tyr Ile Val Glu  
 9540 9545 9550  
 Cys Leu Ala Trp Asp Pro Thr Gly Thr Lys Lys Glu Ala Trp Arg Gln

|   |       |       |
|---|-------|-------|
| 9555  | 9560  | 9565  |
| Cys Asn Lys Arg Asp Val Glu Glu Leu Gln Phe Thr Val Glu Asp Leu |       |       |
| 9570  | 9575  | 9580  |
| Val Glu Gly Gly Glu Tyr Glu Phe Arg Val Lys Ala Val Asn Ala Ala |       |       |
| 9585  | 9590  | 9595  |
| Gly Val Ser Lys Pro Ser Ala Thr Val Gly Pro Cys Asp Cys Gln Arg |       |       |
| 9605  | 9610  | 9615  |
| Pro Asp Met Pro Pro Ser Ile Asp Leu Lys Glu Phe Met Glu Val Glu |       |       |
| 9620  | 9625  | 9630  |
| Glu Gly Thr Asn Val Asn Ile Val Ala Lys Ile Lys Gly Val Pro Phe |       |       |
| 9635  | 9640  | 9645  |
| Pro Thr Leu Thr Trp Phe Lys Ala Pro Pro Lys Lys Pro Asp Asn Lys |       |       |
| 9650  | 9655  | 9660  |
| Glu Pro Val Leu Tyr Asp Thr His Val Asn Lys Leu Val Val Asp Asp |       |       |
| 9665  | 9670  | 9675  |
| Thr Cys Thr Leu Val Ile Pro Gln Ser Arg Arg Ser Asp Thr Gly Leu |       |       |
| 9685  | 9690  | 9695  |
| Tyr Thr Ile Thr Ala Val Asn Asn Leu Gly Thr Ala Ser Lys Glu Met |       |       |
| 9700  | 9705  | 9710  |
| Arg Leu Asn Val Leu Gly Arg Pro Gly Pro Pro Val Gly Pro Ile Lys |       |       |
| 9715  | 9720  | 9725  |
| Phe Glu Ser Val Ser Ala Asp Gln Met Thr Leu Ser Trp Phe Pro Pro |       |       |
| 9730  | 9735  | 9740  |
| Lys Asp Asp Gly Gly Ser Lys Ile Thr Asn Tyr Val Ile Glu Lys Arg |       |       |
| 9745  | 9750  | 9755  |
| Glu Ala Asn Arg Lys Thr Trp Val His Val Ser Ser Glu Pro Lys Glu |       |       |
| 9765  | 9770  | 9775  |
| Cys Thr Tyr Thr Ile Pro Lys Leu Leu Glu Gly His Glu Tyr Val Phe |       |       |
| 9780  | 9785  | 9790  |
| Arg Ile Met Ala Gln Asn Lys Tyr Gly Ile Gly Glu Pro Leu Asp Ser |       |       |
| 9795  | 9800  | 9805  |
| Glu Pro Glu Thr Ala Arg Asn Leu Phe Ser Val Pro Gly Ala Pro Asp |       |       |
| 9810  | 9815  | 9820  |
| Lys Pro Thr Val Ser Ser Val Thr Arg Asn Ser Met Thr Val Asn Trp |       |       |
| 9825  | 9830  | 9835  |
| Glu Glu Pro Glu Tyr Asp Gly Gly Ser Pro Val Thr Gly Tyr Trp Leu |       |       |
| 9845  | 9850  | 9855  |
| Glu Met Lys Asp Thr Thr Ser Lys Arg Trp Lys Arg Val Asn Arg Asp |       |       |
| 9860  | 9865  | 9870  |
| Pro Ile Lys Ala Met Thr Leu Gly Val Ser Tyr Lys Val Thr Gly Leu |       |       |
| 9875  | 9880  | 9885  |
| Ile Glu Gly Ser Asp Tyr Gln Phe Arg Val Tyr Ala Ile Asn Ala Ala |       |       |
| 9890  | 9895  | 9900  |
| Gly Val Gly Pro Ala Ser Leu Pro Ser Asp Pro Ala Thr Ala Arg Asp |       |       |
| 9905  | 9910  | 9915  |
| Pro Ile Ala Pro Pro Gly Pro Pro Phe Pro Lys Val Thr Asp Trp Thr |       |       |
| 9925  | 9930  | 9935  |
| Lys Ser Ser Ala Asp Leu Glu Trp Ser Pro Pro Leu Lys Asp Gly Gly |       |       |
| 9940  | 9945  | 9950  |
| Ser Lys Val Thr Gly Tyr Ile Val Glu Tyr Lys Glu Glu Gly Lys Glu |       |       |
| 9955  | 9960  | 9965  |
| Glu Trp Glu Lys Gly Lys Asp Lys Glu Val Arg Gly Thr Lys Leu Val |       |       |
| 9970  | 9975  | 9980  |
| Val Thr Gly Leu Lys Glu Gly Ala Phe Tyr Lys Phe Arg Val Ser Ala |       |       |
| 9985  | 9990  | 9995  |
| Val Asn Ile Ala Gly Ile Gly Glu Pro Gly Glu Val Thr Asp Val Ile |       |       |
| 10005   | 10010 | 10015 |
| Glu Met Lys Asp Arg Leu Val Ser Pro Asp Leu Gln Leu Asp Ala Ser |       |       |
| 10020   | 10025 | 10030 |

Val Arg Asp Arg Ile Val Val His Ala Gly Gly Val Ile Arg Ile Ile  
10035 10040 10045  
Ala Tyr Val Ser Gly Lys Pro Pro Thr Val Thr Trp Asn Met Asn  
10050 10055 10060  
Glu Arg Thr Leu Pro Gln Glu Ala Thr Ile Glu Thr Thr Ala Ile Ser  
10065 10070 10075 10080  
Ser Ser Met Val Ile Lys Asn Cys Gln Arg Ser His Gln Gly Val Tyr  
10085 10090 10095  
Ser Leu Leu Ala Lys Asn Glu Ala Gly Glu Arg Lys Lys Thr Ile Ile  
10100 10105 10110  
Val Asp Val Leu Asp Val Pro Gly Pro Val Gly Thr Pro Phe Leu Ala  
10115 10120 10125  
His Asn Leu Thr Asn Glu Ser Cys Lys Leu Thr Trp Phe Ser Pro Glu  
10130 10135 10140  
Asp Asp Gly Gly Ser Pro Ile Thr Asn Tyr Val Ile Glu Lys Arg Glu  
10145 10150 10155 10160  
Ser Asp Arg Arg Ala Trp Thr Pro Val Thr Tyr Thr Val Thr Arg Gln  
10165 10170 10175  
Asn Ala Thr Val Gln Gly Leu Ile Gln Gly Lys Ala Tyr Phe Phe Arg  
10180 10185 10190  
Ile Ala Ala Glu Asn Ser Ile Gly Met Gly Pro Phe Val Glu Thr Ser  
10195 10200 10205  
Glu Ala Leu Val Ile Arg Glu Pro Ile Thr Val Pro Glu Arg Pro Glu  
10210 10215 10220  
Asp Leu Glu Val Lys Glu Val Thr Lys Asn Thr Val Thr Leu Thr Trp  
10225 10230 10235 10240  
Asn Pro Pro Lys Tyr Asp Gly Gly Ser Glu Ile Ile Asn Tyr Val Leu  
10245 10250 10255  
Glu Ser Arg Leu Ile Gly Thr Glu Lys Phe His Lys Val Thr Asn Asp  
10260 10265 10270  
Asn Leu Leu Ser Arg Lys Tyr Thr Val Lys Gly Leu Lys Glu Gly Asp  
10275 10280 10285  
Thr Tyr Glu Tyr Arg Val Ser Ala Val Asn Ile Val Gly Gln Gly Lys  
10290 10295 10300  
Pro Ser Phe Cys Thr Lys Pro Ile Thr Cys Lys Asp Glu Leu Ala Pro  
10305 10310 10315 10320  
Pro Thr Leu His Leu Asp Phe Arg Asp Lys Leu Thr Ile Arg Val Gly  
10325 10330 10335  
Glu Ala Phe Ala Leu Thr Gly Arg Tyr Ser Gly Lys Pro Lys Pro Lys  
10340 10345 10350  
Val Ser Trp Phe Lys Asp Glu Ala Asp Val Leu Glu Asp Asp Arg Thr  
10355 10360 10365  
His Ile Lys Thr Thr Pro Ala Thr Leu Ala Leu Glu Lys Ile Lys Ala  
10370 10375 10380  
Lys Arg Ser Asp Ser Gly Lys Tyr Cys Val Val Val Glu Asn Ser Thr  
10385 10390 10395 10400  
Gly Ser Arg Lys Gly Phe Cys Gln Val Asn Val Val Asp His Pro Gly  
10405 10410 10415  
Pro Pro Val Gly Pro Val Ser Phe Asp Glu Val Thr Lys Asp Tyr Met  
10420 10425 10430  
Val Ile Ser Trp Lys Pro Pro Leu Asp Asp Gly Gly Ser Lys Ile Thr  
10435 10440 10445  
Asn Tyr Ile Ile Glu Lys Lys Glu Val Gly Lys Asp Val Trp Met Pro  
10450 10455 10460  
Val Thr Ser Ala Ser Ala Lys Thr Thr Cys Lys Val Ser Lys Leu Leu  
10465 10470 10475 10480  
Glu Gly Lys Asp Tyr Ile Phe Arg Ile His Ala Glu Asn Leu Tyr Gly  
10485 10490 10495  
Ile Ser Asp Pro Leu Val Ser Asp Ser Met Lys Ala Lys Asp Arg Phe

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|---|-------|-------|-------|
| Arg Val Pro Asp Ala Pro Asp Gln Pro Ile Val Thr Glu Val Thr Lys | 10500 | 10505 | 10510 |
| 10515   | 10520 | 10525 |       |
| Asp Ser Ala Leu Val Thr Trp Asn Lys Pro His Asp Gly Gly Lys Pro | 10530 | 10535 | 10540 |
| Ile Thr Asn Tyr Ile Leu Glu Lys Arg Glu Thr Met Ser Lys Arg Trp | 10545 | 10550 | 10555 |
| Ala Arg Val Thr Lys Asp Pro Ile His Pro Tyr Thr Lys Phe Arg Val | 10565 | 10570 | 10575 |
| Pro Asp Leu Leu Glu Gly Cys Gln Tyr Glu Phe Arg Val Ser Ala Glu | 10580 | 10585 | 10590 |
| Asn Glu Ile Gly Ile Gly Asp Pro Ser Pro Pro Ser Lys Pro Val Phe | 10595 | 10600 | 10605 |
| Ala Lys Asp Pro Ile Ala Lys Pro Ser Pro Pro Val Asn Pro Glu Ala | 10610 | 10615 | 10620 |
| Ile Asp Thr Thr Cys Asn Ser Val Asp Leu Thr Trp Gln Pro Pro Arg | 10625 | 10630 | 10635 |
| His Asp Gly Gly Ser Lys Ile Leu Gly Tyr Ile Val Glu Tyr Gln Lys | 10645 | 10650 | 10655 |
| Val Gly Asp Glu Glu Trp Arg Arg Ala Asn His Thr Pro Glu Ser Cys | 10660 | 10665 | 10670 |
| Pro Glu Thr Lys Tyr Lys Val Thr Gly Leu Arg Asp Gly Gln Thr Tyr | 10675 | 10680 | 10685 |
| Lys Phe Arg Val Leu Ala Val Asn Ala Ala Gly Glu Ser Asp Pro Ala | 10690 | 10695 | 10700 |
| His Val Pro Glu Pro Val Leu Val Lys Asp Arg Leu Glu Pro Pro Glu | 10705 | 10710 | 10715 |
| Leu Ile Leu Asp Ala Asn Met Ala Arg Glu Gln His Ile Lys Val Gly | 10725 | 10730 | 10735 |
| Asp Thr Leu Arg Leu Ser Ala Ile Ile Lys Gly Val Pro Phe Pro Lys | 10740 | 10745 | 10750 |
| Val Thr Trp Lys Lys Glu Asp Arg Asp Ala Pro Thr Lys Ala Arg Ile | 10755 | 10760 | 10765 |
| Asp Val Thr Pro Val Gly Ser Lys Leu Glu Ile Arg Asn Ala Ala His | 10770 | 10775 | 10780 |
| Glu Asp Gly Gly Ile Tyr Ser Leu Thr Val Glu Asn Pro Ala Gly Ser | 10785 | 10790 | 10795 |
| Lys Thr Val Ser Val Lys Val Leu Val Leu Asp Lys Pro Gly Pro Pro | 10805 | 10810 | 10815 |
| Arg Asp Leu Glu Val Ser Glu Ile Arg Lys Asp Ser Cys Tyr Leu Thr | 10820 | 10825 | 10830 |
| Trp Lys Glu Pro Leu Asp Asp Gly Gly Ser Val Ile Thr Asn Tyr Val | 10835 | 10840 | 10845 |
| Val Glu Arg Arg Asp Val Ala Ser Ala Gln Trp Ser Pro Leu Ser Ala | 10850 | 10855 | 10860 |
| Thr Ser Lys Lys Lys Ser His Phe Ala Lys His Leu Asn Glu Gly Asn | 10865 | 10870 | 10875 |
| Gln Tyr Leu Phe Arg Val Ala Ala Glu Asn Gln Tyr Gly Arg Gly Pro | 10885 | 10890 | 10895 |
| Phe Val Glu Thr Pro Lys Pro Ile Lys Ala Leu Asp Pro Leu His Pro | 10900 | 10905 | 10910 |
| Pro Gly Pro Pro Lys Asp Leu His His Val Asp Val Asp Lys Thr Glu | 10915 | 10920 | 10925 |
| Val Ser Leu Val Trp Asn Lys Pro Asp Arg Asp Gly Gly Ser Pro Ile | 10930 | 10935 | 10940 |
| Thr Gly Tyr Leu Val Glu Tyr Gln Glu Glu Gly Thr Gln Asp Trp Ile | 10945 | 10950 | 10955 |
| Lys Phe Lys Thr Val Thr Asn Leu Glu Cys Val Val Thr Gly Leu Gln | 10965 | 10970 | 10975 |

Gln Gly Lys Thr Tyr Arg Phe Arg Val Lys Ala Glu Asn Ile Val Gly  
 10980 10985 10990  
 Leu Gly Leu Pro Asp Thr Thr Ile Pro Ile Glu Cys Gln Glu Lys Leu  
 10995 11000 11005  
 Val Pro Pro Ser Val Glu Leu Asp Val Lys Leu Ile Glu Gly Leu Val  
 11010 11015 11020  
 Val Lys Ala Gly Thr Thr Val Arg Phe Pro Ala Ile Ile Arg Gly Val  
 11025 11030 11035 11040  
 Pro Val Pro Thr Ala Lys Trp Thr Thr Asp Gly Ser Glu Ile Lys Thr  
 11045 11050 11055  
 Asp Glu His Tyr Thr Val Glu Thr Asp Asn Phe Ser Ser Val Leu Thr  
 11060 11065 11070  
 Ile Lys Asn Cys Leu Arg Arg Asp Thr Gly Glu Tyr Gln Ile Thr Val  
 11075 11080 11085  
 Ser Asn Ala Ala Gly Ser Lys Thr Val Ala Val His Leu Thr Val Leu  
 11090 11095 11100  
 Asp Val Pro Gly Pro Pro Thr Gly Pro Ile Asn Ile Leu Asp Val Thr  
 11105 11110 11115 11120  
 Pro Glu His Met Thr Ile Ser Trp Gln Pro Pro Lys Asp Asp Gly Gly  
 11125 11130 11135  
 Ser Pro Val Ile Asn Tyr Ile Val Glu Lys Gln Asp Thr Arg Lys Asp  
 11140 11145 11150  
 Thr Trp Gly Val Val Ser Ser Gly Ser Ser Lys Thr Lys Leu Lys Ile  
 11155 11160 11165  
 Pro His Leu Gln Lys Gly Cys Glu Tyr Val Phe Arg Val Arg Ala Glu  
 11170 11175 11180  
 Asn Lys Ile Gly Val Gly Pro Pro Leu Asp Ser Thr Pro Thr Val Ala  
 11185 11190 11195 11200  
 Lys His Lys Phe Ser Pro Pro Ser Pro Pro Gly Lys Pro Val Val Thr  
 11205 11210 11215  
 Asp Ile Thr Glu Asn Ala Ala Thr Val Ser Trp Thr Leu Pro Lys Ser  
 11220 11225 11230  
 Asp Gly Gly Ser Pro Ile Thr Gly Tyr Tyr Met Glu Arg Arg Glu Val  
 11235 11240 11245  
 Thr Gly Lys Trp Val Arg Val Asn Lys Thr Pro Ile Ala Asp Leu Lys  
 11250 11255 11260  
 Phe Arg Val Thr Gly Leu Tyr Glu Gly Asn Thr Tyr Glu Phe Arg Val  
 11265 11270 11275 11280  
 Phe Ala Glu Asn Leu Ala Gly Leu Ser Lys Pro Ser Pro Ser Asp  
 11285 11290 11295  
 Pro Ile Lys Ala Cys Arg Pro Ile Lys Pro Pro Gly Pro Pro Ile Asn  
 11300 11305 11310  
 Pro Lys Leu Lys Asp Lys Ser Arg Glu Thr Ala Asp Leu Val Trp Thr  
 11315 11320 11325  
 Lys Pro Leu Ser Asp Gly Gly Ser Pro Ile Leu Gly Tyr Val Val Glu  
 11330 11335 11340  
 Cys Gln Lys Pro Gly Thr Ala Gln Trp Asn Arg Ile Asn Lys Asp Glu  
 11345 11350 11355 11360  
 Leu Ile Arg Gln Cys Ala Phe Arg Val Pro Gly Leu Ile Glu Gly Asn  
 11365 11370 11375  
 Glu Tyr Arg Phe Arg Ile Lys Ala Ala Asn Ile Val Gly Glu Gly Glu  
 11380 11385 11390  
 Pro Arg Glu Leu Ala Glu Ser Val Ile Ala Lys Asp Ile Leu His Pro  
 11395 11400 11405  
 Pro Glu Val Glu Leu Asp Val Thr Cys Arg Asp Val Ile Thr Val Arg  
 11410 11415 11420  
 Val Gly Gln Thr Ile Arg Ile Leu Ala Arg Val Lys Gly Arg Pro Glu  
 11425 11430 11435 11440  
 Pro Asp Ile Thr Trp Thr Lys Glu Gly Lys Val Leu Val Arg Glu Lys



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|---|-------|-------|-------|
| Arg Val Asp   | 11445 | 11450 | 11455 |
| Leu Ile Gln Asp Leu Pro Arg Val Glu Leu Gln Ile Lys             | 11460 | 11465 | 11470 |
| Glu Ala Val Arg Ala Asp His Gly Lys Tyr Ile Ile Ser Ala Lys Asn | 11475 | 11480 | 11485 |
| Ser Ser Gly His Ala Gln Gly Ser Ala Ile Val Asn Val Leu Asp Arg | 11490 | 11495 | 11500 |
| Pro Gly Pro Cys Gln Asn Leu Lys Val Thr Asn Val Thr Lys Glu Asn | 11505 | 11510 | 11515 |
| Cys Thr Ile Ser Trp Glu Asn Pro Leu Asp Asn Gly Gly Ser Glu Ile | 11525 | 11530 | 11535 |
| Thr Asn Phe Ile Val Glu Tyr Arg Lys Pro Asn Gln Lys Gly Trp Ser | 11540 | 11545 | 11550 |
| Ile Val Ala Ser Asp Val Thr Lys Arg Leu Ile Lys Ala Asn Leu Leu | 11555 | 11560 | 11565 |
| Ala Asn Asn Glu Tyr Tyr Phe Arg Val Cys Ala Glu Asn Lys Val Gly | 11570 | 11575 | 11580 |
| Val Gly Pro Thr Ile Glu Thr Lys Thr Pro Ile Leu Ala Ile Asn Pro | 11585 | 11590 | 11595 |
| Ile Asp Arg Pro Gly Glu Pro Glu Asn Leu His Ile Ala Asp Lys Gly | 11605 | 11610 | 11615 |
| Lys Thr Phe Val Tyr Leu Lys Trp Arg Arg Pro Asp Tyr Asp Gly Gly | 11620 | 11625 | 11630 |
| Ser Pro Asn Leu Ser Tyr His Val Glu Arg Arg Leu Lys Gly Ser Asp | 11635 | 11640 | 11645 |
| Asp Trp Glu Arg Val His Lys Gly Ser Ile Lys Glu Thr His Tyr Met | 11650 | 11655 | 11660 |
| Val Asp Arg Cys Val Glu Asn Gln Ile Tyr Glu Phe Arg Val Gln Thr | 11665 | 11670 | 11675 |
| Lys Asn Glu Gly Gly Glu Ser Asp Trp Val Lys Thr Glu Glu Val Val | 11685 | 11690 | 11695 |
| Val Lys Glu Asp Leu Gln Lys Pro Val Leu Asp Leu Lys Leu Ser Gly | 11700 | 11705 | 11710 |
| Val Leu Thr Val Lys Ala Gly Asp Thr Ile Arg Leu Glu Ala Gly Val | 11715 | 11720 | 11725 |
| Arg Gly Lys Pro Phe Pro Glu Val Ala Trp Thr Lys Asp Lys Asp Ala | 11730 | 11735 | 11740 |
| Thr Asp Leu Thr Arg Ser Pro Arg Val Lys Ile Asp Thr Arg Ala Asp | 11745 | 11750 | 11755 |
| Ser Ser Lys Phe Ser Leu Thr Lys Ala Lys Arg Ser Asp Gly Gly Lys | 11765 | 11770 | 11775 |
| Tyr Val Val Thr Ala Thr Asn Thr Ala Gly Ser Phe Val Ala Tyr Ala | 11780 | 11785 | 11790 |
| Thr Val Asn Val Leu Asp Lys Pro Gly Pro Val Arg Asn Leu Lys Ile | 11795 | 11800 | 11805 |
| Val Asp Val Ser Ser Asp Arg Cys Thr Val Cys Trp Asp Pro Pro Glu | 11810 | 11815 | 11820 |
| Asp Asp Gly Gly Cys Glu Ile Gln Asn Tyr Ile Leu Glu Lys Cys Glu | 11825 | 11830 | 11835 |
| Thr Lys Arg Met Val Trp Ser Thr Tyr Ser Ala Thr Val Leu Thr Pro | 11845 | 11850 | 11855 |
| Gly Thr Thr Val Thr Arg Leu Ile Glu Gly Asn Glu Tyr Ile Phe Arg | 11860 | 11865 | 11870 |
| Val Arg Ala Glu Asn Lys Ile Gly Thr Gly Pro Pro Thr Glu Ser Lys | 11875 | 11880 | 11885 |
| Pro Val Ile Ala Lys Thr Lys Tyr Asp Lys Pro Gly Arg Pro Asp Pro | 11890 | 11895 | 11900 |
| Pro Glu Val Thr Lys Val Ser Lys Glu Glu Met Thr Val Val Trp Asn | 11905 | 11910 | 11915 |
|   |       |       | 11920 |

Pro Pro Glu Tyr Asp Gly Gly Lys Ser Ile Thr Gly Tyr Phe Leu Glu  
 11925 11930 11935  
 Lys Lys Glu Lys His Ser Thr Arg Trp Val Pro Val Asn Lys Ser Ala  
 11940 11945 11950  
 Ile Pro Glu Arg Arg Met Lys Val Gln Asn Leu Leu Pro Asp His Glu  
 11955 11960 11965  
 Tyr Gln Phe Arg Val Lys Ala Glu Asn Glu Ile Gly Ile Gly Glu Pro  
 11970 11975 11980  
 Ser Leu Pro Ser Arg Pro Val Val Ala Lys Asp Pro Ile Glu Pro Pro  
 11985 11990 11995 12000  
 Gly Pro Pro Thr Asn Phe Arg Val Val Asp Thr Thr Lys His Ser Ile  
 12005 12010 12015  
 Thr Leu Gly Trp Gly Lys Pro Val Tyr Asp Gly Gly Ala Pro Ile Ile  
 12020 12025 12030  
 Gly Tyr Val Val Glu Met Arg Pro Lys Ile Ala Asp Ala Ser Pro Asp  
 12035 12040 12045  
 Glu Gly Trp Lys Arg Cys Asn Ala Ala Ala Gln Leu Val Arg Lys Glu  
 12050 12055 12060  
 Phe Thr Val Thr Ser Leu Asp Glu Asn Gln Glu Tyr Glu Phe Arg Val  
 12065 12070 12075 12080  
 Cys Ala Gln Asn Gln Val Gly Ile Gly Arg Pro Ala Glu Leu Lys Glu  
 12085 12090 12095  
 Ala Ile Lys Pro Lys Glu Ile Leu Glu Pro Pro Glu Ile Asp Leu Asp  
 12100 12105 12110  
 Ala Ser Met Arg Lys Leu Val Ile Val Arg Ala Gly Cys Pro Ile Arg  
 12115 12120 12125  
 Leu Phe Ala Ile Val Arg Gly Arg Pro Ala Pro Lys Val Thr Trp Arg  
 12130 12135 12140  
 Lys Val Gly Ile Asp Asn Val Val Arg Lys Gly Gln Val Asp Leu Val  
 12145 12150 12155 12160  
 Asp Thr Met Ala Phe Leu Val Ile Pro Asn Ser Thr Arg Asp Asp Ser  
 12165 12170 12175  
 Gly Lys Tyr Ser Leu Thr Leu Val Asn Pro Ala Gly Glu Lys Ala Val  
 12180 12185 12190  
 Phe Val Asn Val Arg Val Leu Asp Thr Pro Gly Pro Val Ser Asp Leu  
 12195 12200 12205  
 Lys Val Ser Asp Val Thr Lys Thr Ser Cys His Val Ser Trp Ala Pro  
 12210 12215 12220  
 Pro Glu Asn Asp Gly Gly Ser Gln Val Thr His Tyr Ile Val Glu Lys  
 12225 12230 12235 12240  
 Arg Glu Ala Asp Arg Lys Thr Trp Ser Thr Val Thr Pro Glu Val Lys  
 12245 12250 12255  
 Lys Thr Ser Phe His Val Thr Asn Leu Val Pro Gly Asn Glu Tyr Tyr  
 12260 12265 12270  
 Phe Arg Val Thr Ala Val Asn Glu Tyr Gly Pro Gly Val Pro Thr Asp  
 12275 12280 12285  
 Val Pro Lys Pro Val Leu Ala Ser Asp Pro Leu Ser Glu Pro Asp Pro  
 12290 12295 12300  
 Pro Arg Lys Leu Glu Ala Thr Glu Met Thr Lys Asn Ser Ala Thr Leu  
 12305 12310 12315 12320  
 Ala Trp Leu Pro Pro Leu Arg Asp Gly Gly Ala Lys Ile Asp Gly Tyr  
 12325 12330 12335  
 Ile Ile Ser Tyr Arg Glu Glu Glu Gln Pro Ala Asp Arg Trp Thr Glu  
 12340 12345 12350  
 Tyr Ser Val Val Lys Asp Leu Ser Leu Val Val Thr Gly Leu Lys Glu  
 12355 12360 12365  
 Gly Lys Lys Tyr Lys Phe Arg Val Ala Ala Arg Asn Ala Val Gly Val  
 12370 12375 12380  
 Ser Leu Pro Arg Glu Ala Glu Gly Val Tyr Glu Ala Lys Glu Gln Leu

|   |       |       |       |
|---|-------|-------|-------|
| 12385   | 12390 | 12395 | 12400 |
| Leu Pro Pro Lys Ile Leu Met Pro Glu Gln Ile Thr Ile Lys Ala Gly |       |       |       |
| 12405   | 12410 | 12415 |       |
| Lys Lys Leu Arg Ile Glu Ala His Val Tyr Gly Lys Pro His Pro Thr |       |       |       |
| 12420   | 12425 | 12430 |       |
| Cys Lys Trp Lys Lys Gly Glu Asp Glu Val Val Thr Ser Ser His Leu |       |       |       |
| 12435   | 12440 | 12445 |       |
| Ala Val His Lys Ala Asp Ser Ser Ile Leu Ile Ile Lys Asp Val     |       |       |       |
| 12450   | 12455 | 12460 |       |
| Thr Arg Lys Asp Ser Gly Tyr Tyr Ser Leu Thr Ala Glu Asn Ser Ser |       |       |       |
| 12465   | 12470 | 12475 | 12480 |
| Gly Thr Asp Thr Gln Lys Ile Lys Val Val Val Met Asp Ala Pro Gly |       |       |       |
| 12485   | 12490 | 12495 |       |
| Pro Pro Gln Pro Pro Phe Asp Ile Ser Asp Ile Asp Ala Asp Ala Cys |       |       |       |
| 12500   | 12505 | 12510 |       |
| Ser Leu Ser Trp His Ile Pro Leu Glu Asp Gly Gly Ser Asn Ile Thr |       |       |       |
| 12515   | 12520 | 12525 |       |
| Asn Tyr Ile Val Glu Lys Cys Asp Val Ser Arg Gly Asp Trp Val Thr |       |       |       |
| 12530   | 12535 | 12540 |       |
| Ala Leu Ala Ser Val Thr Lys Thr Ser Cys Arg Val Gly Lys Leu Ile |       |       |       |
| 12545   | 12550 | 12555 | 12560 |
| Pro Gly Gln Glu Tyr Ile Phe Arg Val Arg Ala Glu Asn Arg Phe Gly |       |       |       |
| 12565   | 12570 | 12575 |       |
| Ile Ser Glu Pro Leu Thr Ser Pro Lys Met Val Ala Gln Phe Pro Phe |       |       |       |
| 12580   | 12585 | 12590 |       |
| Gly Val Pro Ser Glu Pro Lys Asn Ala Arg Val Thr Lys Val Asn Lys |       |       |       |
| 12595   | 12600 | 12605 |       |
| Asp Cys Ile Phe Val Ala Trp Asp Arg Pro Asp Ser Asp Gly Gly Ser |       |       |       |
| 12610   | 12615 | 12620 |       |
| Pro Ile Ile Gly Tyr Leu Ile Glu Arg Lys Glu Arg Asn Ser Leu Leu |       |       |       |
| 12625   | 12630 | 12635 | 12640 |
| Trp Val Lys Ala Asn Asp Thr Leu Val Arg Ser Thr Glu Tyr Pro Cys |       |       |       |
| 12645   | 12650 | 12655 |       |
| Ala Gly Leu Val Glu Gly Leu Glu Tyr Ser Phe Arg Ile Tyr Ala Leu |       |       |       |
| 12660   | 12665 | 12670 |       |
| Asn Lys Ala Gly Ser Ser Pro Pro Ser Lys Pro Thr Glu Tyr Val Thr |       |       |       |
| 12675   | 12680 | 12685 |       |
| Ala Arg Met Pro Val Asp Pro Pro Gly Lys Pro Glu Val Ile Asp Val |       |       |       |
| 12690   | 12695 | 12700 |       |
| Thr Lys Ser Thr Val Ser Leu Ile Trp Ala Arg Pro Lys His Asp Gly |       |       |       |
| 12705   | 12710 | 12715 | 12720 |
| Gly Ser Lys Ile Ile Gly Tyr Phe Val Glu Ala Cys Lys Leu Pro Gly |       |       |       |
| 12725   | 12730 | 12735 |       |
| Asp Lys Trp Val Arg Cys Asn Thr Ala Pro His Gln Ile Pro Gln Glu |       |       |       |
| 12740   | 12745 | 12750 |       |
| Glu Tyr Thr Ala Thr Gly Leu Glu Glu Lys Ala Gln Tyr Gln Phe Arg |       |       |       |
| 12755   | 12760 | 12765 |       |
| Ala Ile Ala Arg Thr Ala Val Asn Ile Ser Pro Pro Ser Glu Pro Ser |       |       |       |
| 12770   | 12775 | 12780 |       |
| Asp Pro Val Thr Ile Leu Ala Glu Asn Val Pro Pro Arg Ile Asp Leu |       |       |       |
| 12785   | 12790 | 12795 | 12800 |
| Ser Val Ala Met Lys Ser Leu Leu Thr Val Lys Ala Gly Thr Asn Val |       |       |       |
| 12805   | 12810 | 12815 |       |
| Cys Leu Asp Ala Thr Val Phe Gly Lys Pro Met Pro Thr Val Ser Trp |       |       |       |
| 12820   | 12825 | 12830 |       |
| Lys Lys Asp Gly Thr Leu Leu Lys Pro Ala Glu Gly Ile Lys Met Ala |       |       |       |
| 12835   | 12840 | 12845 |       |
| Met Gln Arg Asn Leu Cys Thr Leu Glu Leu Phe Ser Val Asn Arg Lys |       |       |       |
| 12850   | 12855 | 12860 |       |

|   |       |       |       |       |
|---|-------|-------|-------|-------|
| Asp Ser Gly Asp Tyr Thr Ile Thr Ala Glu Asn Ser Ser Gly Ser Lys | 12865 | 12870 | 12875 | 12880 |
| Ser Ala Thr Ile Lys Leu Lys Val Leu Asp Lys Pro Gly Pro Pro Ala | 12885 | 12890 | 12895 |       |
| Ser Val Lys Ile Asn Lys Met Tyr Ser Asp Arg Ala Met Leu Ser Trp | 12900 | 12905 | 12910 |       |
| Glu Pro Pro Leu Glu Asp Gly Gly Ser Glu Ile Thr Asn Tyr Ile Val | 12915 | 12920 | 12925 |       |
| Asp Lys Arg Glu Thr Ser Arg Pro Asn Trp Ala Gln Val Ser Ala Thr | 12930 | 12935 | 12940 |       |
| Val Pro Ile Thr Ser Cys Ser Val Glu Lys Leu Ile Glu Gly His Glu | 12945 | 12950 | 12955 | 12960 |
| Tyr Gln Phe Arg Ile Cys Ala Glu Asn Lys Tyr Gly Val Gly Asp Pro | 12965 | 12970 | 12975 |       |
| Val Phe Thr Glu Pro Ala Ile Ala Lys Asn Pro Tyr Asp Pro Pro Gly | 12980 | 12985 | 12990 |       |
| Arg Cys Asp Pro Pro Val Ile Ser Asn Ile Thr Lys Asp His Met Thr | 12995 | 13000 | 13005 |       |
| Val Ser Trp Lys Pro Pro Ala Asp Asp Gly Gly Ser Pro Ile Thr Gly | 13010 | 13015 | 13020 |       |
| Tyr Leu Leu Glu Lys Arg Glu Thr Gln Ala Val Asn Trp Thr Lys Val | 13025 | 13030 | 13035 | 13040 |
| Asn Arg Lys Pro Ile Ile Glu Arg Thr Leu Lys Ala Thr Gly Leu Gln | 13045 | 13050 | 13055 |       |
| Glu Gly Thr Glu Tyr Glu Phe Arg Val Thr Ala Ile Asn Lys Ala Gly | 13060 | 13065 | 13070 |       |
| Pro Gly Lys Pro Ser Asp Ala Ser Lys Ala Ala Tyr Ala Arg Asp Pro | 13075 | 13080 | 13085 |       |
| Gln Tyr Pro Pro Ala Pro Pro Ala Phe Pro Lys Val Tyr Asp Thr Thr | 13090 | 13095 | 13100 |       |
| Arg Ser Ser Val Ser Leu Ser Trp Gly Lys Pro Ala Tyr Asp Gly Gly | 13105 | 13110 | 13115 | 13120 |
| Ser Pro Ile Ile Gly Tyr Leu Val Glu Val Lys Arg Ala Asp Ser Asp | 13125 | 13130 | 13135 |       |
| Asn Trp Val Arg Cys Asn Leu Pro Gln Asn Leu Gln Lys Thr Arg Phe | 13140 | 13145 | 13150 |       |
| Glu Val Thr Gly Leu Met Glu Asp Thr Gln Tyr Gln Phe Arg Val Tyr | 13155 | 13160 | 13165 |       |
| Ala Val Asn Lys Ile Gly Tyr Ser Asp Pro Ser Asp Val Pro Asp Lys | 13170 | 13175 | 13180 |       |
| His Tyr Pro Lys Asp Ile Leu Ile Pro Pro Glu Gly Glu His Asp Ala | 13185 | 13190 | 13195 | 13200 |
| Asp Leu Arg Lys Thr Leu Ile Leu Arg Ala Gly Val Thr Met Arg Leu | 13205 | 13210 | 13215 |       |
| Tyr Val Pro Val Lys Gly Arg Pro Pro Pro Lys Ile Thr Trp Ser Lys | 13220 | 13225 | 13230 |       |
| Pro Asn Val Asn Leu Arg Asp Arg Ile Gly Leu Asp Ile Lys Ser Thr | 13235 | 13240 | 13245 |       |
| Asp Phe Asp Thr Phe Leu Arg Cys Glu Asn Val Asn Lys Tyr Asp Ala | 13250 | 13255 | 13260 |       |
| Gly Lys Tyr Ile Leu Thr Leu Glu Asn Ser Cys Gly Lys Lys Glu Tyr | 13265 | 13270 | 13275 | 13280 |
| Thr Ile Val Val Lys Val Leu Asp Thr Pro Gly Pro Pro Ile Asn Val | 13285 | 13290 | 13295 |       |
| Thr Val Lys Glu Ile Ser Lys Asp Ser Ala Tyr Val Thr Trp Glu Pro | 13300 | 13305 | 13310 |       |
| Pro Ile Ile Asp Gly Gly Ser Pro Ile Ile Asn Tyr Val Val Gln Lys | 13315 | 13320 | 13325 |       |
| Arg Asp Ala Glu Arg Lys Ser Trp Ser Thr Val Thr Thr Glu Cys Ser |       |       |       |       |

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|---|-------|-------|
| 13330   | 13335 | 13340 |
| Lys Thr Ser Phe Arg Val Pro Asn Leu Glu Glu Gly Lys Ser Tyr Phe |       |       |
| 13345   | 13350 | 13355 |
| Phe Arg Val Phe Ala Glu Asn Glu Tyr Gly Ile Gly Asp Pro Gly Glu |       | 13360 |
| 13365   | 13370 | 13375 |
| Thr Arg Asp Ala Val Lys Ala Ser Gln Thr Pro Gly Pro Val Val Asp |       |       |
| 13380   | 13385 | 13390 |
| Leu Lys Val Arg Ser Val Ser Lys Ser Ser Cys Ser Ile Gly Trp Lys |       |       |
| 13395   | 13400 | 13405 |
| Lys Pro His Ser Asp Gly Gly Ser Arg Ile Ile Gly Tyr Val Val Asp |       |       |
| 13410   | 13415 | 13420 |
| Phe Leu Thr Glu Glu Asn Lys Trp Gln Arg Val Met Lys Ser Leu Ser |       |       |
| 13425   | 13430 | 13435 |
| Leu Gln Tyr Ser Ala Lys Asp Leu Thr Glu Gly Lys Glu Tyr Thr Phe |       | 13440 |
| 13445   | 13450 | 13455 |
| Arg Val Ser Ala Glu Asn Glu Asn Gly Glu Gly Thr Pro Ser Glu Ile |       |       |
| 13460   | 13465 | 13470 |
| Thr Val Val Ala Arg Asp Asp Val Val Ala Pro Asp Leu Asp Leu Lys |       |       |
| 13475   | 13480 | 13485 |
| Gly Leu Pro Asp Leu Cys Tyr Leu Ala Lys Glu Asn Ser Asn Phe Arg |       |       |
| 13490   | 13495 | 13500 |
| Leu Lys Ile Pro Ile Lys Gly Lys Pro Ala Pro Ser Val Ser Trp Lys |       |       |
| 13505   | 13510 | 13515 |
| Lys Gly Glu Asp Pro Leu Ala Thr Asp Thr Arg Val Ser Val Glu Ser |       | 13520 |
| 13525   | 13530 | 13535 |
| Ser Ala Val Asn Thr Thr Leu Ile Val Tyr Asp Cys Gln Lys Ser Asp |       |       |
| 13540   | 13545 | 13550 |
| Ala Gly Lys Tyr Thr Ile Thr Leu Lys Asn Val Ala Gly Thr Lys Glu |       |       |
| 13555   | 13560 | 13565 |
| Gly Thr Ile Ser Ile Lys Val Val Gly Lys Pro Gly Ile Pro Thr Gly |       |       |
| 13570   | 13575 | 13580 |
| Pro Ile Lys Phe Asp Glu Val Thr Ala Glu Ala Met Thr Leu Lys Trp |       |       |
| 13585   | 13590 | 13595 |
| Ala Pro Pro Lys Asp Asp Gly Gly Ser Glu Ile Thr Asn Tyr Ile Leu |       | 13600 |
| 13605   | 13610 | 13615 |
| Glu Lys Arg Asp Ser Val Asn Asn Lys Trp Val Thr Cys Ala Ser Ala |       |       |
| 13620   | 13625 | 13630 |
| Val Gln Lys Thr Thr Phe Arg Val Thr Arg Leu His Glu Gly Met Glu |       |       |
| 13635   | 13640 | 13645 |
| Tyr Thr Phe Arg Val Ser Ala Glu Asn Lys Tyr Gly Val Gly Glu Gly |       |       |
| 13650   | 13655 | 13660 |
| Leu Lys Ser Glu Pro Ile Val Ala Arg His Pro Phe Asp Val Pro Asp |       |       |
| 13665   | 13670 | 13675 |
| Ala Pro Pro Pro Pro Asn Ile Val Asp Val Arg His Asp Ser Val Ser |       | 13680 |
| 13685   | 13690 | 13695 |
| Leu Thr Trp Thr Asp Pro Lys Lys Thr Gly Gly Ser Pro Ile Thr Gly |       |       |
| 13700   | 13705 | 13710 |
| Tyr His Leu Glu Phe Lys Glu Arg Asn Ser Leu Leu Trp Lys Arg Ala |       |       |
| 13715   | 13720 | 13725 |
| Asn Lys Thr Pro Ile Arg Met Arg Asp Phe Lys Val Thr Gly Leu Thr |       |       |
| 13730   | 13735 | 13740 |
| Glu Gly Leu Glu Tyr Glu Phe Arg Val Met Ala Ile Asn Leu Ala Gly |       |       |
| 13745   | 13750 | 13755 |
| Val Gly Lys Pro Ser Leu Pro Ser Glu Pro Val Val Ala Leu Asp Pro |       | 13760 |
| 13765   | 13770 | 13775 |
| Ile Asp Pro Pro Gly Lys Pro Glu Val Ile Asn Ile Thr Arg Asn Ser |       |       |
| 13780   | 13785 | 13790 |
| Val Thr Leu Ile Trp Thr Glu Pro Lys Tyr Asp Gly Gly His Lys Leu |       |       |
| 13795   | 13800 | 13805 |

Thr Gly Tyr Ile Val Glu Lys Arg Asp Leu Pro Ser Lys Ser Trp Met  
 13810 13815 13820  
 Lys Ala Asn His Val Asn Val Pro Glu Cys Ala Phe Thr Val Thr Asp  
 13825 13830 13835 13840  
 Leu Val Glu Gly Gly Lys Tyr Glu Phe Arg Ile Arg Ala Lys Asn Thr  
 13845 13850 13855  
 Ala Gly Ala Ile Ser Ala Pro Ser Glu Ser Thr Glu Thr Ile Ile Cys  
 13860 13865 13870  
 Lys Asp Glu Tyr Glu Ala Pro Thr Ile Val Leu Asp Pro Thr Ile Lys  
 13875 13880 13885  
 Asp Gly Leu Thr Ile Lys Ala Gly Asp Thr Ile Val Leu Asn Ala Ile  
 13890 13895 13900  
 Ser Ile Leu Gly Lys Pro Leu Pro Lys Ser Ser Trp Ser Lys Ala Gly  
 13905 13910 13915 13920  
 Lys Asp Ile Arg Pro Ser Asp Ile Thr Gln Ile Thr Ser Thr Pro Thr  
 13925 13930 13935  
 Ser Ser Met Leu Thr Ile Lys Tyr Ala Thr Arg Lys Asp Ala Gly Glu  
 13940 13945 13950  
 Tyr Thr Ile Thr Ala Thr Asn Pro Phe Gly Thr Lys Val Glu His Val  
 13955 13960 13965  
 Lys Val Thr Val Leu Asp Val Pro Gly Pro Pro Gly Pro Val Glu Ile  
 13970 13975 13980  
 Ser Asn Val Ser Ala Glu Lys Ala Thr Leu Thr Trp Thr Pro Pro Leu  
 13985 13990 13995 14000  
 Glu Asp Gly Gly Ser Pro Ile Lys Ser Tyr Ile Leu Glu Lys Arg Glu  
 14005 14010 14015  
 Thr Ser Arg Leu Leu Trp Thr Val Val Ser Glu Asp Ile Gln Ser Cys  
 14020 14025 14030  
 Arg His Val Ala Thr Lys Leu Ile Gln Gly Asn Glu Tyr Ile Phe Arg  
 14035 14040 14045  
 Val Ser Ala Val Asn His Tyr Gly Lys Gly Glu Pro Val Gln Ser Glu  
 14050 14055 14060  
 Pro Val Lys Met Val Asp Arg Phe Gly Pro Pro Gly Pro Pro Glu Lys  
 14065 14070 14075 14080  
 Pro Glu Val Ser Asn Val Thr Lys Asn Thr Ala Thr Val Ser Trp Lys  
 14085 14090 14095  
 Arg Pro Val Asp Asp Gly Gly Ser Glu Ile Thr Gly Tyr His Val Glu  
 14100 14105 14110  
 Arg Arg Glu Lys Lys Ser Leu Arg Trp Val Arg Ala Ile Lys Thr Pro  
 14115 14120 14125  
 Val Ser Asp Leu Arg Cys Lys Val Thr Gly Leu Gln Glu Gly Ser Thr  
 14130 14135 14140  
 Tyr Glu Phe Arg Val Ser Ala Glu Asn Arg Ala Gly Ile Gly Pro Pro  
 14145 14150 14155 14160  
 Ser Glu Ala Ser Asp Ser Val Leu Met Lys Asp Ala Ala Tyr Pro Pro  
 14165 14170 14175  
 Gly Pro Pro Ser Asn Pro His Val Thr Asp Thr Thr Lys Lys Ser Ala  
 14180 14185 14190  
 Ser Leu Ala Trp Gly Lys Pro His Tyr Asp Gly Gly Leu Glu Ile Thr  
 14195 14200 14205  
 Gly Tyr Val Val Glu His Gln Lys Val Gly Asp Glu Ala Trp Ile Lys  
 14210 14215 14220  
 Asp Thr Thr Gly Thr Ala Leu Arg Ile Thr Gln Phe Val Val Pro Asp  
 14225 14230 14235 14240  
 Leu Gln Thr Lys Glu Lys Tyr Asn Phe Arg Ile Ser Ala Ile Asn Asp  
 14245 14250 14255  
 Ala Gly Val Gly Glu Pro Ala Val Ile Pro Asp Val Glu Ile Val Glu  
 14260 14265 14270  
 Arg Glu Met Ala Pro Asp Phe Glu Leu Asp Ala Glu Leu Arg Arg Thr

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|---|-------|-------|
| 14275   | 14280 | 14285 |
| Leu Val Val Arg Ala Gly Leu Ser Ile Arg Ile Phe Val Pro Ile Lys |       |       |
| 14290   | 14295 | 14300 |
| Gly Arg Pro Ala Pro Glu Val Thr Trp Thr Lys Asp Asn Ile Asn Leu |       |       |
| 14305   | 14310 | 14315 |
| Lys Asn Arg Ala Asn Ile Glu Asn Thr Glu Ser Phe Thr Leu Leu Ile |       | 14320 |
| 14325   | 14330 | 14335 |
| Ile Pro Glu Cys Asn Arg Tyr Asp Thr Gly Lys Phe Val Met Thr Ile |       |       |
| 14340   | 14345 | 14350 |
| Glu Asn Pro Ala Gly Lys Lys Ser Gly Phe Val Asn Val Arg Val Leu |       |       |
| 14355   | 14360 | 14365 |
| Asp Thr Pro Gly Pro Val Leu Asn Leu Arg Pro Thr Asp Ile Thr Lys |       |       |
| 14370   | 14375 | 14380 |
| Asp Ser Val Thr Leu His Trp Asp Leu Pro Leu Ile Asp Gly Gly Ser |       |       |
| 14385   | 14390 | 14395 |
| Arg Ile Thr Asn Tyr Ile Val Glu Lys Arg Glu Ala Thr Arg Lys Ser |       | 14400 |
| 14405   | 14410 | 14415 |
| Tyr Ser Thr Ala Thr Thr Lys Cys His Lys Cys Thr Tyr Lys Val Thr |       |       |
| 14420   | 14425 | 14430 |
| Gly Leu Ser Glu Gly Cys Glu Tyr Phe Phe Arg Val Met Ala Glu Asn |       |       |
| 14435   | 14440 | 14445 |
| Glu Tyr Gly Ile Gly Glu Pro Thr Glu Thr Thr Glu Pro Val Lys Ala |       |       |
| 14450   | 14455 | 14460 |
| Ser Glu Ala Pro Ser Pro Pro Asp Ser Leu Asn Ile Met Asp Ile Thr |       |       |
| 14465   | 14470 | 14475 |
| Lys Ser Thr Val Ser Leu Ala Trp Pro Lys Pro Lys His Asp Gly Gly |       | 14480 |
| 14485   | 14490 | 14495 |
| Ser Lys Ile Thr Gly Tyr Val Ile Glu Ala Gln Arg Lys Gly Ser Asp |       |       |
| 14500   | 14505 | 14510 |
| Gln Trp Thr His Ile Thr Thr Val Lys Gly Leu Glu Cys Val Val Arg |       |       |
| 14515   | 14520 | 14525 |
| Asn Leu Thr Glu Gly Glu Glu Tyr Thr Phe Gln Val Met Ala Val Asn |       |       |
| 14530   | 14535 | 14540 |
| Ser Ala Gly Arg Ser Ala Pro Arg Glu Ser Arg Pro Val Ile Val Lys |       |       |
| 14545   | 14550 | 14555 |
| Glu Gln Thr Met Leu Pro Glu Leu Asp Leu Arg Gly Ile Tyr Gln Lys |       | 14560 |
| 14565   | 14570 | 14575 |
| Leu Val Ile Ala Lys Ala Gly Asp Asn Ile Lys Val Glu Ile Pro Val |       |       |
| 14580   | 14585 | 14590 |
| Leu Gly Arg Pro Lys Pro Thr Val Thr Trp Lys Lys Gly Asp Gln Ile |       |       |
| 14595   | 14600 | 14605 |
| Leu Lys Gln Thr Gln Arg Val Asn Phe Glu Thr Thr Ala Thr Ser Thr |       |       |
| 14610   | 14615 | 14620 |
| Ile Leu Asn Ile Asn Glu Cys Val Arg Ser Asp Ser Gly Pro Tyr Pro |       |       |
| 14625   | 14630 | 14635 |
| Leu Thr Ala Arg Asn Ile Val Gly Glu Val Gly Asp Val Ile Thr Ile |       | 14640 |
| 14645   | 14650 | 14655 |
| Gln Val His Asp Ile Pro Gly Pro Pro Thr Gly Pro Ile Lys Phe Asp |       |       |
| 14660   | 14665 | 14670 |
| Glu Val Ser Ser Asp Phe Val Thr Phe Ser Trp Asp Pro Pro Glu Asn |       |       |
| 14675   | 14680 | 14685 |
| Asp Gly Gly Val Pro Ile Ser Asn Tyr Val Val Glu Met Arg Gln Thr |       |       |
| 14690   | 14695 | 14700 |
| Asp Ser Thr Thr Trp Val Glu Leu Ala Thr Thr Val Ile Arg Thr Thr |       |       |
| 14705   | 14710 | 14715 |
| Tyr Lys Ala Thr Arg Leu Thr Thr Gly Leu Glu Tyr Gln Phe Arg Val |       | 14720 |
| 14725   | 14730 | 14735 |
| Lys Ala Gln Asn Arg Tyr Gly Val Gly Pro Gly Ile Thr Ser Ala Trp |       |       |
| 14740   | 14745 | 14750 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |       |       |       |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|
| Ile | Val | Ala | Asn | Tyr | Pro | Phe | Lys | Val | Pro | Gly | Pro | Pro | Gly | Thr | Pro | 14755 | 14760 | 14765 |
| Gln | Val | Thr | Ala | Val | Thr | Lys | Asp | Ser | Met | Thr | Ile | Ser | Trp | His | Glu | 14770 | 14775 | 14780 |
| Pro | Leu | Ser | Asp | Gly | Gly | Ser | Pro | Ile | Leu | Gly | Tyr | His | Val | Glu | Arg | 14785 | 14790 | 14795 |
| Lys | Glu | Arg | Asn | Gly | Ile | Leu | Trp | Gln | Thr | Val | Ser | Lys | Ala | Leu | Val | 14805 | 14810 | 14815 |
| Pro | Gly | Asn | Ile | Phe | Lys | Ser | Ser | Gly | Leu | Thr | Asp | Gly | Ile | Ala | Tyr | 14820 | 14825 | 14830 |
| Glu | Phe | Arg | Val | Ile | Ala | Glu | Asn | Met | Ala | Gly | Lys | Ser | Lys | Pro | Ser | 14835 | 14840 | 14845 |
| Lys | Pro | Ser | Glu | Pro | Met | Leu | Ala | Leu | Asp | Pro | Ile | Asp | Pro | Pro | Gly | 14850 | 14855 | 14860 |
| Lys | Pro | Val | Pro | Leu | Asn | Ile | Thr | Arg | His | Thr | Val | Thr | Leu | Lys | Trp | 14865 | 14870 | 14875 |
| Ala | Lys | Pro | Glu | Tyr | Thr | Gly | Gly | Phe | Lys | Ile | Thr | Ser | Tyr | Ile | Val | 14885 | 14890 | 14895 |
| Glu | Lys | Arg | Asp | Leu | Pro | Asn | Gly | Arg | Trp | Leu | Lys | Ala | Asn | Phe | Ser | 14900 | 14905 | 14910 |
| Asn | Ile | Leu | Glu | Asn | Glu | Phe | Thr | Val | Ser | Gly | Leu | Thr | Glu | Asp | Ala | 14915 | 14920 | 14925 |
| Ala | Tyr | Glu | Phe | Arg | Val | Ile | Ala | Lys | Asn | Ala | Ala | Gly | Ala | Ile | Ser | 14930 | 14935 | 14940 |
| Pro | Pro | Ser | Glu | Pro | Ser | Asp | Ala | Ile | Thr | Cys | Arg | Asp | Asp | Val | Glu | 14945 | 14950 | 14955 |
| Ala | Pro | Lys | Ile | Lys | Val | Asp | Val | Lys | Phe | Lys | Asp | Thr | Val | Ile | Leu | 14965 | 14970 | 14975 |
| Lys | Ala | Gly | Glu | Ala | Phe | Arg | Leu | Glu | Ala | Asp | Val | Ser | Gly | Arg | Pro | 14980 | 14985 | 14990 |
| Pro | Pro | Thr | Met | Glu | Trp | Ser | Lys | Asp | Gly | Lys | Glu | Leu | Glu | Gly | Thr | 14995 | 15000 | 15005 |
| Ala | Lys | Leu | Glu | Ile | Lys | Ile | Ala | Asp | Phe | Ser | Thr | Asn | Leu | Val | Asn | 15010 | 15015 | 15020 |
| Lys | Asp | Ser | Thr | Arg | Arg | Asp | Ser | Gly | Ala | Tyr | Thr | Leu | Thr | Ala | Thr | 15025 | 15030 | 15035 |
| Asn | Pro | Gly | Gly | Phe | Ala | Lys | His | Ile | Phe | Asn | Val | Lys | Val | Leu | Asp | 15045 | 15050 | 15055 |
| Arg | Pro | Gly | Pro | Pro | Glu | Gly | Pro | Leu | Ala | Val | Thr | Glu | Val | Thr | Ser | 15060 | 15065 | 15070 |
| Glu | Lys | Cys | Val | Leu | Ser | Trp | Phe | Pro | Pro | Leu | Asp | Asp | Gly | Gly | Ala | 15075 | 15080 | 15085 |
| Lys | Ile | Asp | His | Tyr | Ile | Val | Gln | Lys | Arg | Glu | Thr | Ser | Arg | Leu | Ala | 15090 | 15095 | 15100 |
| Trp | Thr | Asn | Val | Ala | Ser | Glu | Val | Gln | Val | Thr | Lys | Leu | Lys | Val | Thr | 15105 | 15110 | 15115 |
| Lys | Leu | Leu | Lys | Gly | Asn | Glu | Tyr | Ile | Phe | Arg | Val | Met | Ala | Val | Asn | 15125 | 15130 | 15135 |
| Lys | Tyr | Gly | Val | Gly | Glu | Pro | Leu | Glu | Ser | Glu | Pro | Val | Leu | Ala | Val | 15140 | 15145 | 15150 |
| Asn | Pro | Tyr | Gly | Pro | Pro | Asp | Pro | Pro | Lys | Asn | Pro | Glu | Val | Thr | Thr | 15155 | 15160 | 15165 |
| Ile | Thr | Lys | Asp | Ser | Met | Val | Val | Cys | Trp | Gly | His | Pro | Asp | Ser | Asp | 15170 | 15175 | 15180 |
| Gly | Gly | Ser | Glu | Ile | Ile | Asn | Tyr | Ile | Val | Glu | Arg | Arg | Asp | Lys | Ala | 15185 | 15190 | 15195 |
| Gly | Gln | Arg | Trp | Ile | Lys | Cys | Asn | Lys | Lys | Thr | Leu | Thr | Asp | Leu | Arg | 15205 | 15210 | 15215 |
| Tyr | Lys | Val | Ser | Gly | Leu | Thr | Glu | Gly | His | Glu | Tyr | Glu | Phe | Arg | Ile |       |       |       |





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|-----|-----|-----|-------|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|-------|--|
| Val | Asn | Ala | Glu   | Ser | Thr | Glu | Asn | Asn | Ser   | Leu | Leu | Thr | Ile | Lys | Asp   |  |
|     |     |     | 15700 |     |     |     |     |     | 15705 |     |     |     |     |     | 15710 |  |
| Ala | Cys | Arg | Glu   | Asp | Val | Gly | His | Tyr | Val   | Val | Lys | Leu | Thr | Asn | Ser   |  |
|     |     |     | 15715 |     |     |     |     |     | 15720 |     |     |     |     |     | 15725 |  |
| Ala | Gly | Glu | Ala   | Ile | Glu | Thr | Leu | Asn | Val   | Ile | Val | Leu | Asp | Lys | Pro   |  |
|     |     |     | 15730 |     |     |     |     |     | 15735 |     |     |     |     |     | 15740 |  |
| Gly | Pro | Pro | Thr   | Gly | Pro | Val | Lys | Met | Asp   | Glu | Val | Thr | Ala | Asp | Ser   |  |
|     |     |     | 15745 |     |     |     |     |     | 15750 |     |     |     |     |     | 15755 |  |
| Ile | Thr | Leu | Ser   | Trp | Gly | Pro | Pro | Lys | Tyr   | Asp | Gly | Gly | Ser | Ser | Ile   |  |
|     |     |     |       |     |     |     |     |     | 15765 |     |     |     |     |     | 15770 |  |
| Asn | Asn | Tyr | Ile   | Val | Glu | Lys | Arg | Asp | Thr   | Ser | Thr | Thr | Thr | Trp | Gln   |  |
|     |     |     |       |     |     |     |     |     | 15780 |     |     |     |     |     | 15785 |  |
| Ile | Val | Ser | Ala   | Thr | Val | Ala | Arg | Thr | Thr   | Ile | Lys | Ala | Cys | Arg | Leu   |  |
|     |     |     |       |     |     |     |     |     | 15795 |     |     |     |     |     | 15800 |  |
| Lys | Thr | Gly | Cys   | Glu | Tyr | Gln | Phe | Arg | Ile   | Ala | Ala | Glu | Asn | Arg | Tyr   |  |
|     |     |     |       |     |     |     |     |     | 15810 |     |     |     |     |     | 15815 |  |
| Gly | Lys | Ser | Thr   | Tyr | Leu | Asn | Ser | Glu | Pro   | Thr | Val | Ala | Gln | Tyr | Pro   |  |
|     |     |     |       |     |     |     |     |     | 15825 |     |     |     |     |     | 15830 |  |
| Phe | Lys | Val | Pro   | Gly | Pro | Pro | Gly | Thr | Pro   | Val | Val | Thr | Leu | Ser | Ser   |  |
|     |     |     |       |     |     |     |     |     | 15845 |     |     |     |     |     | 15850 |  |
| Arg | Asp | Ser | Met   | Glu | Val | Gln | Trp | Asn | Glu   | Pro | Ile | Ser | Asp | Gly | Gly   |  |
|     |     |     |       |     |     |     |     |     | 15860 |     |     |     |     |     | 15865 |  |
| Ser | Arg | Val | Ile   | Gly | Tyr | His | Leu | Glu | Arg   | Lys | Glu | Arg | Asn | Ser | Ile   |  |
|     |     |     |       |     |     |     |     |     | 15875 |     |     |     |     |     | 15880 |  |
| Leu | Trp | Val | Lys   | Leu | Asn | Lys | Thr | Pro | Ile   | Pro | Gln | Thr | Lys | Phe | Lys   |  |
|     |     |     |       |     |     |     |     |     | 15890 |     |     |     |     |     | 15895 |  |
| Thr | Thr | Gly | Leu   | Glu | Glu | Gly | Val | Glu | Tyr   | Glu | Phe | Arg | Val | Ser | Ala   |  |
|     |     |     |       |     |     |     |     |     | 15905 |     |     |     |     |     | 15910 |  |
| Glu | Asn | Ile | Val   | Gly | Ile | Gly | Lys | Pro | Ser   | Lys | Val | Ser | Glu | Cys | Tyr   |  |
|     |     |     |       |     |     |     |     |     | 15925 |     |     |     |     |     | 15930 |  |
| Val | Ala | Arg | Asp   | Pro | Cys | Asp | Pro | Pro | Gly   | Arg | Pro | Glu | Ala | Ile | Ile   |  |
|     |     |     |       |     |     |     |     |     | 15940 |     |     |     |     |     | 15945 |  |
| Val | Thr | Arg | Asn   | Ser | Val | Thr | Leu | Gln | Trp   | Lys | Lys | Pro | Thr | Tyr | Asp   |  |
|     |     |     |       |     |     |     |     |     | 15955 |     |     |     |     |     | 15960 |  |
| Gly | Gly | Ser | Lys   | Ile | Thr | Gly | Tyr | Ile | Val   | Glu | Lys | Lys | Glu | Leu | Pro   |  |
|     |     |     |       |     |     |     |     |     | 15970 |     |     |     |     |     | 15975 |  |
| Glu | Gly | Arg | Trp   | Met | Lys | Ala | Ser | Phe | Thr   | Asn | Ile | Ile | Asp | Thr | His   |  |
|     |     |     |       |     |     |     |     |     | 15985 |     |     |     |     |     | 15990 |  |
| Phe | Glu | Val | Thr   | Gly | Leu | Val | Glu | Asp | His   | Arg | Tyr | Glu | Phe | Arg | Val   |  |
|     |     |     |       |     |     |     |     |     | 15995 |     |     |     |     |     | 16000 |  |
| Ile | Ala | Arg | Asn   | Ala | Ala | Gly | Val | Phe | Ser   | Glu | Pro | Ser | Glu | Ser | Thr   |  |
|     |     |     |       |     |     |     |     |     | 16005 |     |     |     |     |     | 16010 |  |
| Gly | Ala | Ile | Thr   | Ala | Arg | Asp | Glu | Val | Asp   | Pro | Pro | Arg | Ile | Ser | Met   |  |
|     |     |     |       |     |     |     |     |     | 16020 |     |     |     |     |     | 16025 |  |
| Asp | Pro | Lys | Tyr   | Lys | Asp | Thr | Ile | Val | Val   | His | Ala | Gly | Glu | Ser | Phe   |  |
|     |     |     |       |     |     |     |     |     | 16035 |     |     |     |     |     | 16040 |  |
| Lys | Val | Asp | Ala   | Asp | Ile | Tyr | Gly | Lys | Pro   | Ile | Pro | Thr | Ile | Gln | Trp   |  |
|     |     |     |       |     |     |     |     |     | 16050 |     |     |     |     |     | 16055 |  |
| Ile | Lys | Gly | Asp   | Gln | Glu | Leu | Ser | Asn | Thr   | Ala | Arg | Leu | Glu | Ile | Lys   |  |
|     |     |     |       |     |     |     |     |     | 16065 |     |     |     |     |     | 16070 |  |
| Ser | Thr | Asp | Phe   | Ala | Thr | Ser | Leu | Ser | Val   | Lys | Asp | Ala | Val | Arg | Val   |  |
|     |     |     |       |     |     |     |     |     | 16085 |     |     |     |     |     | 16090 |  |
| Asp | Ser | Gly | Asn   | Tyr | Ile | Leu | Lys | Ala | Lys   | Asn | Val | Ala | Gly | Glu | Arg   |  |
|     |     |     |       |     |     |     |     |     | 16100 |     |     |     |     |     | 16105 |  |
| Ser | Val | Thr | Val   | Asn | Val | Lys | Val | Leu | Asp   | Arg | Pro | Gly | Pro | Pro | Glu   |  |
|     |     |     |       |     |     |     |     |     | 16115 |     |     |     |     |     | 16120 |  |
| Gly | Pro | Val | Val   | Ile | Ser | Gly | Val | Thr | Ala   | Glu | Lys | Cys | Thr | Leu | Ala   |  |
|     |     |     |       |     |     |     |     |     | 16125 |     |     |     |     |     | 16130 |  |
| Trp | Lys | Pro | Pro   | Leu | Gln | Asp | Gly | Gly | Ser   | Asp | Ile | Ile | Asn | Tyr | Ile   |  |
|     |     |     |       |     |     |     |     |     | 16135 |     |     |     |     |     | 16140 |  |
|     |     |     |       |     |     |     |     |     | 16145 |     |     |     |     |     | 16150 |  |
|     |     |     |       |     |     |     |     |     |       |     |     |     |     |     | 16155 |  |
|     |     |     |       |     |     |     |     |     |       |     |     |     |     |     | 16160 |  |



Thr Val Asp Asp Val Thr Arg Asn Ser Val Ser Leu Ser Trp Thr Lys  
 16645 16650 16655  
 Pro Glu His Asp Gly Gly Ser Lys Ile Ile Gln Tyr Ile Val Glu Met  
 16660 16665 16670  
 Gln Ala Lys His Ser Glu Lys Trp Ser Glu Cys Ala Arg Val Lys Ser  
 16675 16680 16685  
 Leu Gln Ala Val Ile Thr Asn Leu Thr Gln Gly Glu Glu Tyr Leu Phe  
 16690 16695 16700  
 Arg Val Val Ala Val Asn Glu Lys Gly Arg Ser Asp Pro Arg Ser Leu  
 16705 16710 16715 16720  
 Ala Val Pro Ile Val Ala Lys Asp Leu Val Ile Glu Pro Asp Val Lys  
 16725 16730 16735  
 Pro Ala Phe Ser Ser Tyr Ser Val Gln Val Gly Gln Asp Leu Lys Ile  
 16740 16745 16750  
 Glu Val Pro Ile Ser Gly Arg Pro Lys Pro Thr Ile Thr Trp Thr Lys  
 16755 16760 16765  
 Asp Gly Leu Pro Leu Lys Gln Thr Thr Arg Ile Asn Val Thr Asp Ser  
 16770 16775 16780  
 Leu Asp Leu Thr Thr Leu Ser Ile Lys Glu Thr His Lys Asp Asp Gly  
 16785 16790 16795 16800  
 Gly Gln Tyr Gly Ile Thr Val Ala Asn Val Val Gly Gln Lys Thr Ala  
 16805 16810 16815  
 Ser Ile Glu Ile Val Thr Leu Asp Lys Pro Asp Pro Pro Lys Gly Pro  
 16820 16825 16830  
 Val Lys Phe Asp Asp Val Ser Ala Glu Ser Ile Thr Leu Ser Trp Asn  
 16835 16840 16845  
 Pro Pro Leu Tyr Thr Gly Gly Cys Gln Ile Thr Asn Tyr Ile Val Gln  
 16850 16855 16860  
 Lys Arg Asp Thr Thr Thr Val Trp Asp Val Val Ser Ala Thr Val  
 16865 16870 16875 16880  
 Ala Arg Thr Thr Leu Lys Val Thr Lys Leu Lys Thr Gly Thr Glu Tyr  
 16885 16890 16895  
 Gln Phe Arg Ile Phe Ala Glu Asn Arg Tyr Gly Gln Ser Phe Ala Leu  
 16900 16905 16910  
 Glu Ser Asp Pro Ile Val Ala Gln Tyr Pro Tyr Lys Glu Pro Gly Pro  
 16915 16920 16925  
 Pro Gly Thr Pro Phe Ala Thr Ala Ile Ser Lys Asp Ser Met Val Ile  
 16930 16935 16940  
 Gln Trp His Glu Pro Val Asn Asn Gly Gly Ser Pro Val Ile Gly Tyr  
 16945 16950 16955 16960  
 His Leu Glu Arg Lys Glu Arg Asn Ser Ile Leu Trp Thr Lys Val Asn  
 16965 16970 16975  
 Lys Thr Ile Ile His Asp Thr Gln Phe Lys Ala Gln Asn Leu Glu Glu  
 16980 16985 16990  
 Gly Ile Glu Tyr Glu Phe Arg Val Tyr Ala Glu Asn Ile Val Gly Val  
 16995 17000 17005  
 Gly Lys Ala Ser Lys Asn Ser Glu Cys Tyr Val Ala Arg Asp Pro Cys  
 17010 17015 17020  
 Asp Pro Pro Gly Thr Pro Glu Pro Ile Met Val Lys Arg Asn Glu Ile  
 17025 17030 17035 17040  
 Thr Leu Gln Trp Thr Lys Pro Val Tyr Asp Gly Gly Ser Met Ile Thr  
 17045 17050 17055  
 Gly Tyr Ile Val Glu Lys Arg Asp Leu Pro Asp Gly Arg Trp Met Lys  
 17060 17065 17070  
 Ala Ser Phe Thr Asn Val Ile Glu Thr Gln Phe Thr Val Ser Gly Leu  
 17075 17080 17085  
 Thr Glu Asp Gln Arg Tyr Glu Phe Arg Val Ile Ala Lys Asn Ala Ala  
 17090 17095 17100  
 Gly Ala Ile Ser Lys Pro Ser Asp Ser Thr Gly Pro Ile Thr Ala Lys

|   |       |       |       |       |       |       |
|---|-------|-------|-------|-------|-------|-------|
| 17105   |       | 17110 |       | 17115 |       | 17120 |
| Asp Glu Val Glu Leu Pro Arg Ile Ser Met Asp Pro Lys Phe Arg Asp |       |       |       |       |       |       |
|   | 17125 |       | 17130 |       | 17135 |       |
| Thr Ile Val Val Asn Ala Gly Glu Thr Phe Arg Leu Glu Ala Asp Val |       |       |       |       |       |       |
|   | 17140 |       | 17145 |       | 17150 |       |
| His Gly Lys Pro Leu Pro Thr Ile Glu Trp Leu Arg Gly Asp Lys Glu |       |       |       |       |       |       |
|   | 17155 |       | 17160 |       | 17165 |       |
| Ile Glu Glu Ser Ala Arg Cys Glu Ile Lys Asn Thr Asp Phe Lys Ala |       |       |       |       |       |       |
|   | 17170 |       | 17175 |       | 17180 |       |
| Leu Leu Ile Val Lys Asp Ala Ile Arg Ile Asp Gly Gly Gln Tyr Ile |       |       |       |       |       |       |
|   | 17185 |       | 17190 |       | 17195 | 17200 |
| Leu Arg Ala Ser Asn Val Ala Gly Ser Lys Ser Phe Pro Val Asn Val |       |       |       |       |       |       |
|   | 17205 |       | 17210 |       | 17215 |       |
| Lys Val Leu Asp Arg Pro Gly Pro Pro Glu Gly Pro Val Gln Val Thr |       |       |       |       |       |       |
|   | 17220 |       | 17225 |       | 17230 |       |
| Gly Val Thr Ser Glu Lys Cys Ser Leu Thr Trp Ser Pro Pro Leu Gln |       |       |       |       |       |       |
|   | 17235 |       | 17240 |       | 17245 |       |
| Asp Gly Gly Ser Asp Ile Ser His Tyr Val Val Glu Lys Arg Glu Thr |       |       |       |       |       |       |
|   | 17250 |       | 17255 |       | 17260 |       |
| Ser Arg Leu Ala Trp Thr Val Val Ala Ser Glu Val Val Thr Asn Ser |       |       |       |       |       |       |
|   | 17265 |       | 17270 |       | 17275 | 17280 |
| Leu Lys Val Thr Lys Leu Leu Glu Gly Asn Glu Tyr Val Phe Arg Ile |       |       |       |       |       |       |
|   | 17285 |       | 17290 |       | 17295 |       |
| Met Ala Val Asn Lys Tyr Gly Val Gly Glu Pro Leu Glu Ser Ala Pro |       |       |       |       |       |       |
|   | 17300 |       | 17305 |       | 17310 |       |
| Val Leu Met Lys Asn Pro Phe Val Leu Pro Gly Pro Pro Lys Ser Leu |       |       |       |       |       |       |
|   | 17315 |       | 17320 |       | 17325 |       |
| Glu Val Thr Asn Ile Ala Lys Asp Ser Met Thr Val Cys Trp Asn Arg |       |       |       |       |       |       |
|   | 17330 |       | 17335 |       | 17340 |       |
| Pro Asp Ser Asp Gly Gly Ser Glu Ile Ile Gly Tyr Ile Val Glu Lys |       |       |       |       |       |       |
|   | 17345 |       | 17350 |       | 17355 | 17360 |
| Arg Asp Arg Ser Gly Ile Arg Trp Ile Lys Cys Asn Lys Arg Arg Ile |       |       |       |       |       |       |
|   | 17365 |       | 17370 |       | 17375 |       |
| Thr Asp Leu Arg Leu Arg Val Thr Gly Leu Thr Glu Asp His Glu Tyr |       |       |       |       |       |       |
|   | 17380 |       | 17385 |       | 17390 |       |
| Glu Phe Arg Val Ser Ala Glu Asn Ala Ala Gly Val Gly Glu Pro Ser |       |       |       |       |       |       |
|   | 17395 |       | 17400 |       | 17405 |       |
| Pro Ala Thr Val Tyr Tyr Lys Ala Cys Asp Pro Val Phe Lys Pro Gly |       |       |       |       |       |       |
|   | 17410 |       | 17415 |       | 17420 |       |
| Pro Pro Thr Asn Ala His Ile Val Asp Thr Thr Lys Asn Ser Ile Thr |       |       |       |       |       |       |
|   | 17425 |       | 17430 |       | 17435 | 17440 |
| Leu Ala Trp Gly Lys Pro Ile Tyr Asp Gly Gly Ser Glu Ile Leu Gly |       |       |       |       |       |       |
|   | 17445 |       | 17450 |       | 17455 |       |
| Tyr Val Val Glu Ile Cys Lys Ala Asp Glu Glu Glu Trp Gln Ile Val |       |       |       |       |       |       |
|   | 17460 |       | 17465 |       | 17470 |       |
| Thr Pro Gln Thr Gly Leu Arg Val Thr Arg Phe Glu Ile Ser Lys Leu |       |       |       |       |       |       |
|   | 17475 |       | 17480 |       | 17485 |       |
| Thr Glu His Gln Glu Tyr Lys Ile Arg Val Cys Ala Leu Asn Lys Val |       |       |       |       |       |       |
|   | 17490 |       | 17495 |       | 17500 |       |
| Gly Leu Gly Glu Ala Thr Ser Val Pro Gly Thr Val Lys Pro Glu Asp |       |       |       |       |       |       |
|   | 17505 |       | 17510 |       | 17515 | 17520 |
| Lys Leu Glu Ala Pro Glu Leu Asp Leu Asp Ser Glu Leu Arg Lys Gly |       |       |       |       |       |       |
|   | 17525 |       | 17530 |       | 17535 |       |
| Ile Val Val Arg Ala Gly Gly Ser Ala Arg Ile His Ile Pro Phe Lys |       |       |       |       |       |       |
|   | 17540 |       | 17545 |       | 17550 |       |
| Gly Arg Pro Met Pro Glu Ile Thr Trp Ser Arg Glu Glu Gly Glu Phe |       |       |       |       |       |       |
|   | 17555 |       | 17560 |       | 17565 |       |
| Thr Asp Lys Val Gln Ile Glu Lys Gly Val Asn Tyr Thr Gln Leu Ser |       |       |       |       |       |       |
|   | 17570 |       | 17575 |       | 17580 |       |

Ile Asp Asn Cys Asp Arg Asn Asp Ala Gly Lys Tyr Ile Leu Lys Leu  
 17585 17590 17595 17600  
 Glu Asn Ser Ser Gly Ser Lys Ser Ala Phe Val Thr Val Lys Val Leu  
 17605 17610 17615  
 Asp Thr Pro Gly Pro Pro Gln Asn Leu Ala Val Lys Glu Val Arg Lys  
 17620 17625 17630  
 Asp Ser Ala Phe Leu Val Trp Glu Pro Pro Ile Ile Asp Gly Gly Ala  
 17635 17640 17645  
 Lys Val Lys Asn Tyr Val Ile Asp Lys Arg Glu Ser Thr Arg Lys Ala  
 17650 17655 17660  
 Tyr Ala Asn Val Ser Ser Lys Cys Ser Lys Thr Ser Phe Lys Val Glu  
 17665 17670 17675 17680  
 Asn Leu Thr Glu Gly Ala Ile Tyr Tyr Phe Arg Val Met Ala Glu Asn  
 17685 17690 17695  
 Glu Phe Gly Val Gly Val Pro Val Glu Thr Val Asp Ala Val Lys Ala  
 17700 17705 17710  
 Ala Glu Pro Pro Ser Pro Pro Gly Lys Val Thr Leu Thr Asp Val Ser  
 17715 17720 17725  
 Gln Thr Ser Ala Ser Leu Met Trp Glu Lys Pro Glu His Asp Gly Gly  
 17730 17735 17740  
 Ser Arg Val Leu Gly Tyr Val Val Glu Met Gln Pro Lys Gly Thr Glu  
 17745 17750 17755 17760  
 Lys Trp Ser Ile Val Ala Glu Ser Lys Val Cys Asn Ala Val Val Thr  
 17765 17770 17775  
 Gly Leu Ser Ser Gly Gln Glu Tyr Gln Phe Arg Val Lys Ala Tyr Asn  
 17780 17785 17790  
 Glu Lys Gly Lys Ser Asp Pro Arg Val Leu Gly Val Pro Val Ile Ala  
 17795 17800 17805  
 Lys Asp Leu Thr Ile Gln Pro Ser Leu Lys Leu Pro Phe Asn Thr Tyr  
 17810 17815 17820  
 Ser Ile Gln Ala Gly Glu Asp Leu Lys Ile Glu Ile Pro Val Ile Gly  
 17825 17830 17835 17840  
 Arg Pro Arg Pro Asn Ile Ser Trp Val Lys Asp Gly Glu Pro Leu Lys  
 17845 17850 17855  
 Gln Thr Thr Arg Val Asn Val Glu Glu Thr Ala Thr Ser Thr Val Leu  
 17860 17865 17870  
 His Ile Lys Glu Gly Asn Lys Asp Asp Phe Gly Lys Tyr Thr Val Thr  
 17875 17880 17885  
 Ala Thr Asn Ser Ala Gly Thr Ala Thr Glu Asn Leu Ser Val Ile Val  
 17890 17895 17900  
 Leu Glu Lys Pro Gly Pro Pro Val Gly Pro Val Arg Phe Asp Glu Val  
 17905 17910 17915 17920  
 Ser Ala Asp Phe Val Val Ile Ser Trp Glu Pro Pro Ala Tyr Thr Gly  
 17925 17930 17935  
 Gly Cys Gln Ile Ser Asn Tyr Ile Val Glu Lys Arg Asp Thr Thr Thr  
 17940 17945 17950  
 Thr Thr Trp His Met Val Ser Ala Thr Val Ala Arg Thr Thr Ile Lys  
 17955 17960 17965  
 Ile Thr Lys Leu Lys Thr Gly Thr Glu Tyr Gln Phe Arg Ile Phe Ala  
 17970 17975 17980  
 Glu Asn Arg Tyr Gly Lys Ser Ala Pro Leu Asp Ser Lys Ala Val Ile  
 17985 17990 17995 18000  
 Val Gln Tyr Pro Phe Lys Glu Pro Gly Pro Pro Gly Thr Pro Phe Val  
 18005 18010 18015  
 Thr Ser Ile Ser Lys Asp Gln Met Leu Val Gln Trp His Glu Pro Val  
 18020 18025 18030  
 Asn Asp Gly Gly Thr Lys Ile Ile Gly Tyr His Leu Glu Gln Lys Glu  
 18035 18040 18045  
 Lys Asn Ser Ile Leu Trp Val Lys Leu Asn Lys Thr Pro Ile Gln Asp

|                     |                 |                             |
|---------------------|-----------------|-----------------------------|
| 18050               | 18055           | 18060                       |
| Thr Lys Phe Lys Thr | Thr Gly Leu Asp | Gly Leu Glu Tyr Glu Phe     |
| 18065               | 18070           | 18075                       |
| Lys Val Ser Ala Glu | Asn Ile Val Gly | Ile Gly Lys Pro Ser Lys Val |
| 18085               | 18090           | 18095                       |
| Ser Glu Cys Phe Val | Ala Arg Asp Pro | Cys Asp Pro Pro Gly Arg Pro |
| 18100               | 18105           | 18110                       |
| Glu Ala Ile Val Ile | Thr Arg Asn Asn | Val Thr Leu Lys Trp Lys Lys |
| 18115               | 18120           | 18125                       |
| Pro Ala Tyr Asp Gly | Gly Ser Lys Ile | Thr Gly Tyr Ile Val Glu Lys |
| 18130               | 18135           | 18140                       |
| Lys Asp Leu Pro Asp | Gly Arg Trp Met | Lys Ala Ser Phe Thr Asn Val |
| 18145               | 18150           | 18155                       |
| Leu Glu Thr Glu Phe | Thr Val Ser Gly | Leu Val Glu Asp Gln Arg Tyr |
| 18165               | 18170           | 18175                       |
| Glu Phe Arg Val Ile | Ala Arg Asn Ala | Ala Gly Asn Phe Ser Glu Pro |
| 18180               | 18185           | 18190                       |
| Ser Asp Ser Ser Gly | Ala Ile Thr Ala | Arg Asp Glu Ile Asp Ala Pro |
| 18195               | 18200           | 18205                       |
| Asn Ala Ser Leu Asp | Pro Lys Tyr Lys | Asp Val Ile Val Val His Ala |
| 18210               | 18215           | 18220                       |
| Gly Glu Thr Phe Val | Leu Glu Ala Asp | Ile Arg Gly Lys Pro Ile Pro |
| 18225               | 18230           | 18235                       |
| Asp Val Val Trp Ser | Lys Asp Gly Lys | Glu Leu Glu Glu Thr Ala Ala |
| 18245               | 18250           | 18255                       |
| Arg Met Glu Ile Lys | Ser Thr Ile Gln | Lys Thr Thr Leu Val Val Lys |
| 18260               | 18265           | 18270                       |
| Asp Cys Ile Arg Thr | Asp Gly Gly Gln | Tyr Ile Leu Lys Leu Ser Asn |
| 18275               | 18280           | 18285                       |
| Val Gly Gly Thr Lys | Ser Ile Pro Ile | Thr Val Lys Val Leu Asp Arg |
| 18290               | 18295           | 18300                       |
| Pro Gly Ser Pro Glu | Gly Pro Leu Lys | Val Thr Gly Val Thr Ala Glu |
| 18305               | 18310           | 18315                       |
| Lys Cys Tyr Leu Ala | Trp Asn Pro Pro | Leu Gln Asp Gly Gly Ala Asn |
| 18325               | 18330           | 18335                       |
| Ile Ser His Tyr Ile | Ile Glu Lys Arg | Glu Thr Ser Arg Leu Ser Trp |
| 18340               | 18345           | 18350                       |
| Thr Gln Val Ser Thr | Glu Val Gln Ala | Leu Asn Tyr Lys Val Thr Lys |
| 18355               | 18360           | 18365                       |
| Leu Leu Pro Gly Asn | Glu Tyr Ile Phe | Arg Val Met Ala Val Asn Lys |
| 18370               | 18375           | 18380                       |
| Tyr Gly Ile Gly Glu | Pro Leu Glu Ser | Gly Pro Val Thr Ala Cys Asn |
| 18385               | 18390           | 18395                       |
| Pro Tyr Lys Pro Pro | Gly Pro Pro Ser | Thr Pro Glu Val Ser Ala Ile |
| 18405               | 18410           | 18415                       |
| Thr Lys Asp Ser Met | Val Val Thr Trp | Ala Arg Pro Val Asp Asp Gly |
| 18420               | 18425           | 18430                       |
| Gly Thr Glu Ile Glu | Gly Tyr Ile Leu | Glu Lys Arg Asp Lys Glu Gly |
| 18435               | 18440           | 18445                       |
| Val Arg Trp Thr Lys | Cys Asn Lys Lys | Thr Leu Thr Asp Leu Arg Leu |
| 18450               | 18455           | 18460                       |
| Arg Val Thr Gly Leu | Thr Glu Gly His | Ser Tyr Glu Phe Arg Val Ala |
| 18465               | 18470           | 18475                       |
| Ala Glu Asn Ala Ala | Gly Val Gly Glu | Pro Ser Glu Pro Ser Val Phe |
| 18485               | 18490           | 18495                       |
| Tyr Arg Ala Cys Asp | Ala Leu Tyr Pro | Pro Gly Pro Pro Ser Asn Pro |
| 18500               | 18505           | 18510                       |
| Lys Val Thr Asp Thr | Ser Arg Ser Ser | Val Ser Leu Ala Trp Ser Lys |
| 18515               | 18520           | 18525                       |

Pro Ile Tyr Asp Gly Gly Ala Pro Val Lys Gly Tyr Val Val Glu Val  
 18530 18535 18540  
 Lys Glu Ala Ala Ala Asp Glu Trp Thr Thr Cys Thr Pro Pro Thr Gly  
 18545 18550 18555 18560  
 Leu Gln Gly Lys Gln Phe Thr Val Thr Lys Leu Lys Glu Asn Thr Glu  
 18565 18570 18575  
 Tyr Asn Phe Arg Ile Cys Ala Ile Asn Ser Glu Gly Val Gly Glu Pro  
 18580 18585 18590  
 Ala Thr Leu Pro Gly Ser Val Val Ala Gln Glu Arg Ile Glu Pro Pro  
 18595 18600 18605  
 Glu Ile Glu Leu Asp Ala Asp Leu Arg Lys Val Val Val Leu Arg Ala  
 18610 18615 18620  
 Ser Ala Thr Leu Arg Leu Phe Val Thr Ile Lys Gly Arg Pro Glu Pro  
 18625 18630 18635 18640  
 Glu Val Lys Trp Glu Lys Ala Glu Gly Ile Leu Thr Asp Arg Ala Gln  
 18645 18650 18655  
 Ile Glu Val Thr Ser Ser Phe Thr Met Leu Val Ile Asp Asn Val Thr  
 18660 18665 18670  
 Arg Phe Asp Ser Gly Arg Tyr Asn Leu Thr Leu Glu Asn Asn Ser Gly  
 18675 18680 18685  
 Ser Lys Thr Ala Phe Val Asn Val Arg Val Leu Asp Ser Pro Ser Ala  
 18690 18695 18700  
 Pro Val Asn Leu Thr Ile Arg Glu Val Lys Lys Asp Ser Val Thr Leu  
 18705 18710 18715 18720  
 Ser Trp Glu Pro Pro Leu Ile Asp Gly Gly Ala Lys Ile Thr Asn Tyr  
 18725 18730 18735  
 Ile Val Glu Lys Arg Glu Thr Thr Arg Lys Ala Tyr Ala Thr Ile Thr  
 18740 18745 18750  
 Asn Asn Cys Thr Lys Thr Thr Phe Arg Ile Glu Asn Leu Gln Glu Gly  
 18755 18760 18765  
 Cys Ser Tyr Tyr Phe Arg Val Leu Ala Ser Asn Glu Tyr Gly Ile Gly  
 18770 18775 18780  
 Leu Pro Ala Glu Thr Thr Glu Pro Val Lys Val Ser Glu Pro Pro Leu  
 18785 18790 18795 18800  
 Pro Pro Gly Arg Val Thr Leu Val Asp Val Thr Arg Asn Thr Ala Thr  
 18805 18810 18815  
 Ile Lys Trp Glu Lys Pro Glu Ser Asp Gly Gly Ser Lys Ile Thr Gly  
 18820 18825 18830  
 Tyr Val Val Glu Met Gln Thr Lys Gly Ser Glu Lys Trp Ser Thr Cys  
 18835 18840 18845  
 Thr Gln Val Lys Thr Leu Glu Ala Thr Ile Ser Gly Leu Thr Ala Gly  
 18850 18855 18860  
 Glu Glu Tyr Val Phe Arg Val Ala Ala Val Asn Glu Lys Gly Arg Ser  
 18865 18870 18875 18880  
 Asp Pro Arg Gln Leu Gly Val Pro Val Ile Ala Arg Asp Ile Glu Ile  
 18885 18890 18895  
 Lys Pro Ser Val Glu Leu Pro Phe His Thr Phe Asn Val Lys Ala Arg  
 18900 18905 18910  
 Glu Gln Leu Lys Ile Asp Val Pro Phe Lys Gly Arg Pro Gln Ala Thr  
 18915 18920 18925  
 Val Asn Trp Arg Lys Asp Gly Gln Thr Leu Lys Glu Thr Thr Arg Val  
 18930 18935 18940  
 Asn Val Ser Ser Ser Lys Thr Val Thr Ser Leu Ser Ile Lys Glu Ala  
 18945 18950 18955 18960  
 Ser Lys Glu Asp Val Gly Thr Tyr Glu Leu Cys Val Ser Asn Ser Ala  
 18965 18970 18975  
 Gly Ser Ile Thr Val Pro Ile Thr Ile Ile Val Leu Asp Arg Pro Gly  
 18980 18985 18990  
 Pro Pro Gly Pro Ile Arg Ile Asp Glu Val Ser Cys Asp Ser Ile Thr



|       |     |     |     |       |     |     |     |       |     |     |     |       |     |     |     |
|-------|-----|-----|-----|-------|-----|-----|-----|-------|-----|-----|-----|-------|-----|-----|-----|
| 18995 |     |     |     | 19000 |     |     |     | 19005 |     |     |     |       |     |     |     |
| Ile   | Ser | Trp | Asn | Pro   | Pro | Glu | Tyr | Asp   | Gly | Gly | Cys | Gln   | Ile | Ser | Asn |
| 19010 |     |     |     | 19015 |     |     |     | 19020 |     |     |     |       |     |     |     |
| Tyr   | Ile | Val | Glu | Lys   | Lys | Glu | Thr | Thr   | Ser | Thr | Thr | Trp   | His | Ile | Val |
| 19025 |     |     |     | 19030 |     |     |     | 19035 |     |     |     | 19040 |     |     |     |
| Ser   | Gln | Ala | Val | Ala   | Arg | Thr | Ser | Ile   | Lys | Ile | Val | Arg   | Leu | Thr | Thr |
| 19045 |     |     |     | 19050 |     |     |     | 19055 |     |     |     |       |     |     |     |
| Gly   | Ser | Glu | Tyr | Gln   | Phe | Arg | Val | Cys   | Ala | Glu | Asn | Arg   | Tyr | Gly | Lys |
| 19060 |     |     |     | 19065 |     |     |     | 19070 |     |     |     |       |     |     |     |
| Ser   | Ser | Tyr | Ser | Glu   | Ser | Ser | Ala | Val   | Val | Ala | Glu | Tyr   | Pro | Phe | Ser |
| 19075 |     |     |     | 19080 |     |     |     | 19085 |     |     |     |       |     |     |     |
| Pro   | Pro | Gly | Pro | Pro   | Gly | Thr | Pro | Lys   | Val | Val | His | Ala   | Thr | Lys | Ser |
| 19090 |     |     |     | 19095 |     |     |     | 19100 |     |     |     |       |     |     |     |
| Thr   | Met | Leu | Val | Thr   | Trp | Gln | Val | Pro   | Val | Asn | Asp | Gly   | Gly | Ser | Arg |
| 19105 |     |     |     | 19110 |     |     |     | 19115 |     |     |     | 19120 |     |     |     |
| Val   | Ile | Gly | Tyr | His   | Leu | Glu | Tyr | Lys   | Glu | Arg | Ser | Ser   | Ile | Leu | Trp |
| 19125 |     |     |     | 19130 |     |     |     | 19135 |     |     |     |       |     |     |     |
| Ser   | Lys | Ala | Asn | Lys   | Ile | Leu | Ile | Ala   | Asp | Thr | Gln | Val   | Lys | Val | Ser |
| 19140 |     |     |     | 19145 |     |     |     | 19150 |     |     |     |       |     |     |     |
| Gly   | Leu | Asp | Glu | Gly   | Leu | Met | Tyr | Glu   | Tyr | Arg | Val | Tyr   | Ala | Glu | Asn |
| 19155 |     |     |     | 19160 |     |     |     | 19165 |     |     |     |       |     |     |     |
| Ile   | Ala | Gly | Ile | Gly   | Lys | Cys | Ser | Lys   | Ser | Cys | Glu | Pro   | Val | Pro | Ala |
| 19170 |     |     |     | 19175 |     |     |     | 19180 |     |     |     |       |     |     |     |
| Arg   | Asp | Pro | Cys | Asp   | Pro | Pro | Gly | Gln   | Pro | Glu | Val | Thr   | Asn | Ile | Thr |
| 19185 |     |     |     | 19190 |     |     |     | 19195 |     |     |     | 19200 |     |     |     |
| Arg   | Lys | Ser | Val | Ser   | Leu | Lys | Trp | Ser   | Lys | Pro | His | Tyr   | Asp | Gly | Gly |
| 19205 |     |     |     | 19210 |     |     |     | 19215 |     |     |     |       |     |     |     |
| Ala   | Lys | Ile | Thr | Gly   | Tyr | Ile | Val | Glu   | Arg | Arg | Glu | Leu   | Pro | Asp | Gly |
| 19220 |     |     |     | 19225 |     |     |     | 19230 |     |     |     |       |     |     |     |
| Arg   | Trp | Leu | Lys | Cys   | Asn | Tyr | Thr | Asn   | Ile | Gln | Glu | Thr   | Tyr | Phe | Glu |
| 19235 |     |     |     | 19240 |     |     |     | 19245 |     |     |     |       |     |     |     |
| Val   | Thr | Glu | Leu | Thr   | Glu | Asp | Gln | Arg   | Tyr | Glu | Phe | Arg   | Val | Phe | Ala |
| 19250 |     |     |     | 19255 |     |     |     | 19260 |     |     |     |       |     |     |     |
| Arg   | Asn | Ala | Ala | Asp   | Ser | Val | Ser | Glu   | Pro | Ser | Glu | Ser   | Thr | Gly | Pro |
| 19265 |     |     |     | 19270 |     |     |     | 19275 |     |     |     | 19280 |     |     |     |
| Ile   | Ile | Val | Lys | Asp   | Asp | Val | Glu | Pro   | Pro | Arg | Val | Met   | Met | Asp | Val |
| 19285 |     |     |     | 19290 |     |     |     | 19295 |     |     |     |       |     |     |     |
| Lys   | Phe | Arg | Asp | Val   | Ile | Val | Val | Lys   | Ala | Gly | Glu | Val   | Leu | Lys | Ile |
| 19300 |     |     |     | 19305 |     |     |     | 19310 |     |     |     |       |     |     |     |
| Asn   | Ala | Asp | Ile | Ala   | Gly | Arg | Pro | Leu   | Pro | Val | Ile | Ser   | Trp | Ala | Lys |
| 19315 |     |     |     | 19320 |     |     |     | 19325 |     |     |     |       |     |     |     |
| Asp   | Gly | Ile | Glu | Ile   | Glu | Glu | Arg | Ala   | Arg | Thr | Glu | Ile   | Ile | Ser | Thr |
| 19330 |     |     |     | 19335 |     |     |     | 19340 |     |     |     |       |     |     |     |
| Asp   | Asn | His | Thr | Leu   | Leu | Thr | Val | Lys   | Asp | Cys | Ile | Arg   | Arg | Asp | Thr |
| 19345 |     |     |     | 19350 |     |     |     | 19355 |     |     |     | 19360 |     |     |     |
| Gly   | Gln | Tyr | Val | Leu   | Thr | Leu | Lys | Asn   | Val | Ala | Gly | Thr   | Arg | Ser | Val |
| 19365 |     |     |     | 19370 |     |     |     | 19375 |     |     |     |       |     |     |     |
| Ala   | Val | Asn | Cys | Lys   | Val | Leu | Asp | Lys   | Pro | Gly | Pro | Pro   | Ala | Gly | Pro |
| 19380 |     |     |     | 19385 |     |     |     | 19390 |     |     |     |       |     |     |     |
| Leu   | Glu | Ile | Asn | Gly   | Leu | Thr | Ala | Glu   | Lys | Cys | Ser | Leu   | Ser | Trp | Gly |
| 19395 |     |     |     | 19400 |     |     |     | 19405 |     |     |     |       |     |     |     |
| Arg   | Pro | Gln | Glu | Asp   | Gly | Gly | Ala | Asp   | Ile | Asp | Tyr | Tyr   | His | Arg | Lys |
| 19410 |     |     |     | 19415 |     |     |     | 19420 |     |     |     |       |     |     |     |
| Lys   | Arg | Glu | Thr | Ser   | His | Leu | Ala | Trp   | Thr | Ile | Cys | Glu   | Gly | Glu | Leu |
| 19425 |     |     |     | 19430 |     |     |     | 19435 |     |     |     | 19440 |     |     |     |
| Gln   | Met | Thr | Ser | Cys   | Lys | Val | Thr | Lys   | Leu | Leu | Lys | Gly   | Asn | Glu | Tyr |
| 19445 |     |     |     | 19450 |     |     |     | 19455 |     |     |     |       |     |     |     |
| Ile   | Phe | Arg | Val | Thr   | Gly | Val | Asn | Lys   | Tyr | Gly | Val | Gly   | Glu | Pro | Leu |
| 19460 |     |     |     | 19465 |     |     |     | 19470 |     |     |     |       |     |     |     |

- 66 -

| 19940 |     |     |     |     | 19945 |     |     |     |     | 19950 |     |     |     |     |     |
|-------|-----|-----|-----|-----|-------|-----|-----|-----|-----|-------|-----|-----|-----|-----|-----|
| Glu   | Asn | Gln | Ala | Gly | Leu   | Ser | Asp | Pro | Arg | Glu   | Leu | Leu | Leu | Pro | Val |
| 19955 |     |     |     |     | 19960 |     |     |     |     | 19965 |     |     |     |     |     |
| Leu   | Ile | Lys | Glu | Gln | Leu   | Glu | Pro | Pro | Glu | Ile   | Asp | Met | Lys | Asn | Phe |
| 19970 |     |     |     |     | 19975 |     |     |     |     | 19980 |     |     |     |     |     |
| Pro   | Ser | His | Thr | Val | Tyr   | Val | Arg | Ala | Gly | Ser   | Asn | Leu | Lys | Val | Asp |
| 19985 |     |     |     |     | 19990 |     |     |     |     | 19995 |     |     |     |     |     |
| Ile   | Pro | Ile | Ser | Gly | Lys   | Pro | Leu | Pro | Lys | Val   | Thr | Leu | Ser | Arg | Asp |
| 20005 |     |     |     |     | 20010 |     |     |     |     | 20015 |     |     |     |     |     |
| Gly   | Val | Pro | Leu | Lys | Ala   | Thr | Met | Arg | Phe | Asn   | Thr | Glu | Ile | Thr | Ala |
| 20020 |     |     |     |     | 20025 |     |     |     |     | 20030 |     |     |     |     |     |
| Glu   | Asn | Leu | Thr | Ile | Asn   | Leu | Lys | Glu | Ser | Val   | Thr | Ala | Asp | Ala | Gly |
| 20035 |     |     |     |     | 20040 |     |     |     |     | 20045 |     |     |     |     |     |
| Arg   | Tyr | Glu | Ile | Thr | Ala   | Ala | Asn | Ser | Ser | Gly   | Thr | Thr | Lys | Ala | Phe |
| 20050 |     |     |     |     | 20055 |     |     |     |     | 20060 |     |     |     |     |     |
| Ile   | Asn | Ile | Val | Val | Leu   | Asp | Arg | Pro | Gly | Pro   | Pro | Thr | Gly | Pro | Val |
| 20065 |     |     |     |     | 20070 |     |     |     |     | 20075 |     |     |     |     |     |
| Val   | Ile | Ser | Asp | Ile | Thr   | Glu | Glu | Ser | Val | Thr   | Leu | Lys | Trp | Glu | Pro |
| 20085 |     |     |     |     | 20090 |     |     |     |     | 20095 |     |     |     |     |     |
| Pro   | Lys | Tyr | Asp | Gly | Gly   | Ser | Gln | Val | Thr | Asn   | Tyr | Ile | Leu | Leu | Lys |
| 20100 |     |     |     |     | 20105 |     |     |     |     | 20110 |     |     |     |     |     |
| Arg   | Glu | Thr | Ser | Thr | Ala   | Val | Trp | Thr | Glu | Val   | Ser | Ala | Thr | Val | Ala |
| 20115 |     |     |     |     | 20120 |     |     |     |     | 20125 |     |     |     |     |     |
| Arg   | Thr | Met | Met | Lys | Val   | Met | Lys | Leu | Thr | Thr   | Gly | Glu | Glu | Tyr | Gln |
| 20130 |     |     |     |     | 20135 |     |     |     |     | 20140 |     |     |     |     |     |
| Phe   | Arg | Ile | Lys | Ala | Glu   | Asn | Arg | Phe | Gly | Ile   | Ser | Asp | His | Ile | Asp |
| 20145 |     |     |     |     | 20150 |     |     |     |     | 20155 |     |     |     |     |     |
| Ser   | Ala | Cys | Val | Thr | Val   | Lys | Leu | Pro | Tyr | Thr   | Thr | Pro | Gly | Pro | Pro |
| 20165 |     |     |     |     | 20170 |     |     |     |     | 20175 |     |     |     |     |     |
| Ser   | Thr | Pro | Trp | Val | Thr   | Asn | Val | Thr | Arg | Glu   | Ser | Ile | Thr | Val | Gly |
| 20180 |     |     |     |     | 20185 |     |     |     |     | 20190 |     |     |     |     |     |
| Trp   | His | Glu | Pro | Val | Ser   | Asn | Gly | Gly | Ser | Ala   | Val | Val | Gly | Tyr | His |
| 20195 |     |     |     |     | 20200 |     |     |     |     | 20205 |     |     |     |     |     |
| Leu   | Glu | Met | Lys | Asp | Arg   | Asn | Ser | Ile | Leu | Trp   | Gln | Lys | Ala | Asn | Lys |
| 20210 |     |     |     |     | 20215 |     |     |     |     | 20220 |     |     |     |     |     |
| Leu   | Val | Ile | Arg | Thr | Thr   | His | Phe | Lys | Val | Thr   | Thr | Ile | Ser | Ala | Gly |
| 20225 |     |     |     |     | 20230 |     |     |     |     | 20235 |     |     |     |     |     |
| Leu   | Ile | Tyr | Glu | Phe | Arg   | Val | Tyr | Ala | Glu | Asn   | Ala | Ala | Gly | Val | Gly |
| 20245 |     |     |     |     | 20250 |     |     |     |     | 20255 |     |     |     |     |     |
| Lys   | Pro | Ser | His | Pro | Ser   | Glu | Pro | Val | Leu | Ala   | Ile | Asp | Ala | Cys | Glu |
| 20260 |     |     |     |     | 20265 |     |     |     |     | 20270 |     |     |     |     |     |
| Pro   | Pro | Arg | Asn | Val | Arg   | Ile | Thr | Asp | Ile | Ser   | Lys | Asn | Ser | Val | Ser |
| 20275 |     |     |     |     | 20280 |     |     |     |     | 20285 |     |     |     |     |     |
| Leu   | Ser | Trp | Gln | Gln | Pro   | Ala | Phe | Asp | Gly | Gly   | Ser | Lys | Ile | Thr | Gly |
| 20290 |     |     |     |     | 20295 |     |     |     |     | 20300 |     |     |     |     |     |
| Tyr   | Ile | Val | Glu | Arg | Arg   | Asp | Leu | Pro | Asp | Gly   | Arg | Trp | Thr | Lys | Ala |
| 20305 |     |     |     |     | 20310 |     |     |     |     | 20315 |     |     |     |     |     |
| Ser   | Phe | Thr | Asn | Val | Thr   | Glu | Thr | Gln | Phe | Thr   | Ile | Ser | Gly | Leu | Thr |
| 20325 |     |     |     |     | 20330 |     |     |     |     | 20335 |     |     |     |     |     |
| Gln   | Asn | Ser | Gln | Tyr | Glu   | Phe | Arg | Val | Phe | Ala   | Arg | Asn | Ala | Val | Gly |
| 20340 |     |     |     |     | 20345 |     |     |     |     | 20350 |     |     |     |     |     |
| Ser   | Ile | Ser | Asn | Pro | Ser   | Glu | Val | Val | Gly | Pro   | Ile | Thr | Cys | Ile | Asp |
| 20355 |     |     |     |     | 20360 |     |     |     |     | 20365 |     |     |     |     |     |
| Ser   | Tyr | Gly | Gly | Pro | Val   | Ile | Asp | Leu | Pro | Leu   | Glu | Tyr | Thr | Glu | Val |
| 20370 |     |     |     |     | 20375 |     |     |     |     | 20380 |     |     |     |     |     |
| Val   | Lys | Tyr | Arg | Ala | Gly   | Thr | Ser | Val | Lys | Leu   | Arg | Ala | Gly | Ile | Ser |
| 20385 |     |     |     |     | 20390 |     |     |     |     | 20395 |     |     |     |     |     |
| Gly   | Lys | Pro | Ala | Pro | Thr   | Ile | Glu | Trp | Tyr | Lys   | Asp | Asp | Lys | Glu | Leu |
| 20405 |     |     |     |     | 20410 |     |     |     |     | 20415 |     |     |     |     |     |

Gln Thr Asn Ala Leu Val Cys Val Glu Asn Thr Thr Asp Leu Ala Ser  
 20420 20425 20430  
 Ile Leu Ile Lys Asp Ala Asp Arg Leu Asn Ser Gly Cys Tyr Glu Leu  
 20435 20440 20445  
 Lys Leu Arg Asn Ala Met Ala Ser Ala Ser Ala Thr Ile Arg Val Gln  
 20450 20455 20460  
 Ile Leu Asp Lys Pro Gly Pro Pro Gly Gly Pro Ile Glu Phe Lys Thr  
 20465 20470 20475 20480  
 Val Thr Ala Glu Lys Ile Thr Leu Leu Trp Arg Pro Pro Ala Asp Asp  
 20485 20490 20495  
 Gly Gly Ala Lys Ile Thr His Tyr Ile Val Glu Lys Arg Glu Thr Ser  
 20500 20505 20510  
 Arg Val Val Trp Ser Met Val Ser Glu His Leu Glu Glu Cys Ile Ile  
 20515 20520 20525  
 Thr Thr Thr Lys Ile Ile Lys Gly Asn Glu Tyr Ile Phe Arg Val Arg  
 20530 20535 20540  
 Ala Val Asn Lys Tyr Gly Ile Gly Glu Pro Leu Glu Ser Asp Ser Val  
 20545 20550 20555 20560  
 Val Ala Lys Asn Ala Phe Val Thr Pro Gly Pro Pro Gly Ile Pro Glu  
 20565 20570 20575  
 Val Thr Lys Ile Thr Lys Asn Ser Met Thr Val Val Trp Ser Arg Pro  
 20580 20585 20590  
 Ile Ala Asp Gly Gly Ser Asp Ile Ser Gly Tyr Phe Leu Glu Lys Arg  
 20595 20600 20605  
 Asp Lys Lys Ser Leu Gly Trp Phe Lys Val Leu Lys Glu Thr Ile Arg  
 20610 20615 20620  
 Asp Thr Arg Gln Lys Val Thr Gly Leu Thr Glu Asn Ser Asp Tyr Gln  
 20625 20630 20635 20640  
 Tyr Arg Val Cys Ala Val Asn Ala Ala Gly Gln Gly Pro Phe Ser Glu  
 20645 20650 20655  
 Pro Ser Glu Phe Tyr Lys Ala Ala Asp Pro Ile Asp Pro Pro Gly Pro  
 20660 20665 20670  
 Pro Ala Lys Ile Arg Ile Ala Asp Ser Thr Lys Ser Ser Ile Thr Leu  
 20675 20680 20685  
 Gly Trp Ser Lys Pro Val Tyr Asp Gly Gly Ser Ala Val Thr Gly Tyr  
 20690 20695 20700  
 Val Val Glu Ile Arg Gln Gly Glu Glu Glu Glu Trp Thr Thr Val Ser  
 20705 20710 20715 20720  
 Thr Lys Gly Glu Val Arg Thr Thr Glu Tyr Val Val Ser Asn Leu Lys  
 20725 20730 20735  
 Pro Gly Val Asn Tyr Tyr Phe Arg Val Ser Ala Val Asn Cys Ala Gly  
 20740 20745 20750  
 Gln Gly Glu Pro Ile Glu Met Asn Glu Pro Val Gln Ala Lys Asp Ile  
 20755 20760 20765  
 Leu Glu Ala Pro Glu Ile Asp Leu Asp Val Ala Leu Arg Thr Ser Val  
 20770 20775 20780  
 Ile Ala Lys Ala Gly Glu Asp Val Gln Val Leu Ile Pro Phe Lys Gly  
 20785 20790 20795 20800  
 Arg Pro Pro Pro Thr Val Thr Trp Arg Lys Asp Glu Lys Asn Leu Gly  
 20805 20810 20815  
 Ser Asp Ala Arg Tyr Ser Ile Glu Asn Thr Asp Ser Ser Ser Leu Leu  
 20820 20825 20830  
 Thr Ile Pro Gln Val Thr Arg Asn Asp Thr Gly Lys Tyr Ile Leu Thr  
 20835 20840 20845  
 Ile Glu Asn Gly Val Gly Glu Pro Lys Ser Ser Thr Val Ser Val Lys  
 20850 20855 20860  
 Val Leu Asp Thr Pro Ala Ala Cys Gln Lys Leu Gln Val Lys His Val  
 20865 20870 20875 20880  
 Ser Arg Gly Thr Val Thr Leu Leu Trp Asp Pro Pro Leu Ile Asp Gly

|       |     |     |     |     |     |     |     |     |     |       |     |     |     |     |       |  |  |  |  |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|-----|-----|-----|-----|-------|--|--|--|--|
| 20885 |     |     |     |     |     |     |     |     |     | 20890 |     |     |     |     | 20895 |  |  |  |  |
| Gly   | Ser | Pro | Ile | Ile | Asn | Tyr | Val | Ile | Glu | Lys   | Arg | Asp | Ala | Thr | Lys   |  |  |  |  |
| 20900 |     |     |     |     |     |     |     |     |     | 20905 |     |     |     |     | 20910 |  |  |  |  |
| Arg   | Thr | Trp | Ser | Val | Val | Ser | His | Lys | Cys | Ser   | Ser | Thr | Ser | Phe | Lys   |  |  |  |  |
| 20915 |     |     |     |     |     |     |     |     |     | 20920 |     |     |     |     | 20925 |  |  |  |  |
| Leu   | Ile | Asp | Leu | Ser | Glu | Lys | Thr | Pro | Phe | Phe   | Phe | Arg | Val | Leu | Ala   |  |  |  |  |
| 20930 |     |     |     |     |     |     |     |     |     | 20935 |     |     |     |     | 20940 |  |  |  |  |
| Glu   | Asn | Glu | Ile | Gly | Ile | Gly | Glu | Pro | Cys | Glu   | Thr | Thr | Glu | Pro | Val   |  |  |  |  |
| 20945 |     |     |     |     |     |     |     |     |     | 20950 |     |     |     |     | 20955 |  |  |  |  |
| Lys   | Ala | Ala | Glu | Val | Pro | Ala | Pro | Ile | Arg | Asp   | Leu | Ser | Met | Lys | Asp   |  |  |  |  |
| 20965 |     |     |     |     |     |     |     |     |     | 20970 |     |     |     |     | 20975 |  |  |  |  |
| Ser   | Thr | Lys | Thr | Ser | Val | Ile | Leu | Ser | Trp | Thr   | Lys | Pro | Asp | Phe | Asp   |  |  |  |  |
| 20980 |     |     |     |     |     |     |     |     |     | 20985 |     |     |     |     | 20990 |  |  |  |  |
| Gly   | Gly | Ser | Val | Ile | Thr | Glu | Tyr | Val | Val | Glu   | Arg | Lys | Gly | Lys | Gly   |  |  |  |  |
| 20995 |     |     |     |     |     |     |     |     |     | 21000 |     |     |     |     | 21005 |  |  |  |  |
| Glu   | Gln | Thr | Trp | Ser | His | Ala | Gly | Ile | Ser | Lys   | Thr | Cys | Glu | Ile | Glu   |  |  |  |  |
| 21010 |     |     |     |     |     |     |     |     |     | 21015 |     |     |     |     | 21020 |  |  |  |  |
| Val   | Ser | Gln | Leu | Lys | Glu | Gln | Ser | Val | Leu | Glu   | Phe | Arg | Val | Phe | Ala   |  |  |  |  |
| 21025 |     |     |     |     |     |     |     |     |     | 21030 |     |     |     |     | 21035 |  |  |  |  |
| Lys   | Asn | Glu | Lys | Gly | Leu | Ser | Asp | Pro | Val | Thr   | Ile | Gly | Pro | Ile | Thr   |  |  |  |  |
| 21045 |     |     |     |     |     |     |     |     |     | 21050 |     |     |     |     | 21055 |  |  |  |  |
| Val   | Lys | Glu | Leu | Ile | Ile | Thr | Pro | Glu | Val | Asp   | Leu | Ser | Asp | Ile | Pro   |  |  |  |  |
| 21060 |     |     |     |     |     |     |     |     |     | 21065 |     |     |     |     | 21070 |  |  |  |  |
| Gly   | Ala | Gln | Val | Thr | Val | Arg | Ile | Gly | His | Asn   | Val | His | Leu | Glu | Leu   |  |  |  |  |
| 21075 |     |     |     |     |     |     |     |     |     | 21080 |     |     |     |     | 21085 |  |  |  |  |
| Pro   | Tyr | Lys | Gly | Lys | Pro | Lys | Pro | Ser | Ile | Ser   | Trp | Leu | Lys | Asp | Gly   |  |  |  |  |
| 21090 |     |     |     |     |     |     |     |     |     | 21095 |     |     |     |     | 21100 |  |  |  |  |
| Leu   | Pro | Leu | Lys | Glu | Ser | Glu | Phe | Val | Arg | Phe   | Ser | Lys | Thr | Glu | Asn   |  |  |  |  |
| 21105 |     |     |     |     |     |     |     |     |     | 21110 |     |     |     |     | 21115 |  |  |  |  |
| Lys   | Ile | Thr | Leu | Ser | Ile | Lys | Asn | Ala | Lys | Lys   | Glu | His | Gly | Gly | Lys   |  |  |  |  |
| 21125 |     |     |     |     |     |     |     |     |     | 21130 |     |     |     |     | 21135 |  |  |  |  |
| Tyr   | Thr | Val | Ile | Leu | Asp | Asn | Ala | Val | Cys | Arg   | Ile | Ala | Val | Pro | Ile   |  |  |  |  |
| 21140 |     |     |     |     |     |     |     |     |     | 21145 |     |     |     |     | 21150 |  |  |  |  |
| Thr   | Val | Ile | Thr | Leu | Gly | Pro | Pro | Ser | Lys | Pro   | Lys | Gly | Pro | Ile | Arg   |  |  |  |  |
| 21155 |     |     |     |     |     |     |     |     |     | 21160 |     |     |     |     | 21165 |  |  |  |  |
| Phe   | Asp | Glu | Ile | Lys | Ala | Asp | Ser | Val | Ile | Leu   | Ser | Trp | Asp | Val | Pro   |  |  |  |  |
| 21170 |     |     |     |     |     |     |     |     |     | 21175 |     |     |     |     | 21180 |  |  |  |  |
| Glu   | Asp | Asn | Gly | Gly | Gly | Glu | Ile | Thr | Cys | Tyr   | Ser | Ile | Glu | Lys | Arg   |  |  |  |  |
| 21185 |     |     |     |     |     |     |     |     |     | 21190 |     |     |     |     | 21195 |  |  |  |  |
| Glu   | Thr | Ser | Gln | Thr | Asn | Trp | Lys | Met | Val | Cys   | Ser | Ser | Val | Ala | Arg   |  |  |  |  |
| 21205 |     |     |     |     |     |     |     |     |     | 21210 |     |     |     |     | 21215 |  |  |  |  |
| Thr   | Thr | Phe | Lys | Val | Pro | Asn | Leu | Val | Lys | Asp   | Ala | Glu | Tyr | Gln | Phe   |  |  |  |  |
| 21220 |     |     |     |     |     |     |     |     |     | 21225 |     |     |     |     | 21230 |  |  |  |  |
| Arg   | Val | Arg | Ala | Glu | Asn | Arg | Tyr | Gly | Val | Ser   | Gln | Pro | Leu | Val | Ser   |  |  |  |  |
| 21235 |     |     |     |     |     |     |     |     |     | 21240 |     |     |     |     | 21245 |  |  |  |  |
| Ser   | Ile | Ile | Val | Ala | Lys | His | Gln | Phe | Arg | Ile   | Pro | Gly | Pro | Pro | Gly   |  |  |  |  |
| 21250 |     |     |     |     |     |     |     |     |     | 21255 |     |     |     |     | 21260 |  |  |  |  |
| Lys   | Pro | Val | Ile | Tyr | Asn | Val | Thr | Ser | Asp | Gly   | Met | Ser | Leu | Thr | Trp   |  |  |  |  |
| 21265 |     |     |     |     |     |     |     |     |     | 21270 |     |     |     |     | 21275 |  |  |  |  |
| Asp   | Ala | Pro | Val | Tyr | Asp | Gly | Gly | Ser | Glu | Val   | Thr | Gly | Phe | His | Val   |  |  |  |  |
| 21285 |     |     |     |     |     |     |     |     |     | 21290 |     |     |     |     | 21295 |  |  |  |  |
| Glu   | Lys | Lys | Glu | Arg | Asn | Ser | Ile | Leu | Trp | Gln   | Lys | Val | Asn | Thr | Ser   |  |  |  |  |
| 21300 |     |     |     |     |     |     |     |     |     | 21305 |     |     |     |     | 21310 |  |  |  |  |
| Pro   | Ile | Ser | Gly | Arg | Glu | Tyr | Arg | Ala | Thr | Gly   | Leu | Val | Glu | Gly | Leu   |  |  |  |  |
| 21315 |     |     |     |     |     |     |     |     |     | 21320 |     |     |     |     | 21325 |  |  |  |  |
| Asp   | Tyr | Gln | Phe | Arg | Val | Tyr | Ala | Glu | Asn | Ser   | Ala | Gly | Leu | Ser | Ser   |  |  |  |  |
| 21330 |     |     |     |     |     |     |     |     |     | 21335 |     |     |     |     | 21340 |  |  |  |  |
| Pro   | Ser | Asp | Pro | Ser | Lys | Phe | Thr | Leu | Ala | Val   | Ser | Pro | Val | Asp | Pro   |  |  |  |  |
| 21345 |     |     |     |     |     |     |     |     |     | 21350 |     |     |     |     | 21355 |  |  |  |  |
|       |     |     |     |     |     |     |     |     |     |       |     |     |     |     |       |  |  |  |  |

Pro Gly Thr Pro Asp Tyr Ile Asp Val Thr Arg Glu Thr Ile Thr Leu  
 21365 .21370. 21375  
 Lys Trp Asn Pro Pro Leu Arg Asp Gly Gly Ser Lys Ile Val Gly Tyr  
 21380 21385 21390  
 Ser Ile Glu Lys Arg Gln Gly Asn Glu Arg Trp Val Arg Cys Asn Phe  
 21395 21400 21405  
 Thr Asp Val Ser Glu Cys Gln Tyr Thr Val Thr Gly Leu Ser Pro Gly  
 21410 21415 21420  
 Asp Arg Tyr Glu Phe Arg Ile Ile Ala Arg Asn Ala Val Gly Thr Ile  
 21425 21430 21435 21440  
 Ser Pro Pro Ser Gln Ser Ser Gly Ile Ile Met Thr Arg Asp Glu Asn  
 21445 21450 21455  
 Val Pro Pro Ile Val Glu Phe Gly Pro Glu Tyr Phe Asp Gly Leu Ile  
 21460 21465 21470  
 Ile Lys Ser Gly Glu Ser Leu Arg Ile Lys Ala Leu Val Gln Gly Arg  
 21475 21480 21485  
 Pro Val Pro Arg Val Thr Trp Phe Lys Asp Gly Val Glu Ile Glu Lys  
 21490 21495 21500  
 Arg Met Asn Met Glu Ile Thr Asn Val Leu Gly Ser Thr Ser Leu Phe  
 21505 21510 21515 21520  
 Val Arg Asp Ala Thr Arg Asp His Arg Gly Val Tyr Thr Val Glu Ala  
 21525 21530 21535  
 Lys Asn Ala Ser Gly Ser Ala Lys Ala Glu Ile Lys Val Lys Val Gln  
 21540 21545 21550  
 Asp Thr Pro Gly Lys Val Val Gly Pro Ile Arg Phe Thr Asn Ile Thr  
 21555 21560 21565  
 Gly Glu Lys Met Thr Leu Trp Trp Asp Ala Pro Leu Asn Asp Gly Cys  
 21570 21575 21580  
 Ala Pro Ile Thr His Tyr Ile Ile Glu Lys Arg Glu Thr Ser Arg Leu  
 21585 21590 21595 21600  
 Ala Trp Ala Leu Ile Glu Asp Lys Cys Glu Ala Gln Ser Tyr Thr Ala  
 21605 21610 21615  
 Ile Lys Leu Ile Asn Gly Asn Glu Tyr Gln Phe Arg Val Ser Ala Val  
 21620 21625 21630  
 Asn Lys Phe Gly Val Gly Arg Pro Leu Asp Ser Asp Pro Val Val Ala  
 21635 21640 21645  
 Gln Ile Gln Tyr Thr Val Pro Asp Ala Pro Gly Ile Pro Glu Pro Ser  
 21650 21655 21660  
 Asn Ile Thr Gly Asn Ser Ile Thr Leu Thr Trp Ala Arg Pro Glu Ser  
 21665 21670 21675 21680  
 Asp Gly Gly Ser Glu Ile Gln Gln Tyr Ile Leu Glu Arg Arg Glu Lys  
 21685 21690 21695  
 Lys Ser Thr Arg Trp Val Lys Val Ile Ser Lys Arg Pro Ile Ser Glu  
 21700 21705 21710  
 Thr Arg Phe Lys Val Thr Gly Leu Thr Glu Gly Asn Glu Tyr Glu Phe  
 21715 21720 21725  
 His Val Met Ala Glu Asn Ala Ala Gly Val Gly Pro Ala Ser Gly Ile  
 21730 21735 21740  
 Ser Arg Leu Ile Lys Cys Arg Glu Pro Val Asn Pro Pro Gly Pro Pro  
 21745 21750 21755 21760  
 Thr Val Val Lys Val Thr Asp Thr Ser Lys Thr Thr Val Ser Leu Glu  
 21765 21770 21775  
 Trp Ser Lys Pro Val Phe Asp Gly Gly Met Glu Ile Ile Gly Tyr Ile  
 21780 21785 21790  
 Ile Glu Met Cys Lys Thr Asp Leu Gly Asp Trp His Lys Val Asn Ala  
 21795 21800 21805  
 Glu Ala Cys Val Lys Thr Arg Tyr Thr Val Thr Asp Leu Gln Ala Gly  
 21810 21815 21820  
 Glu Glu Tyr Lys Phe Arg Val Ser Ala Ile Asn Gly Ala Gly Lys Gly

|   |       |       |       |
|---|-------|-------|-------|
| 21825   | 21830 | 21835 | 21840 |
| Asp Ser Cys Glu Val Thr Gly Thr Ile Lys Ala Val Asp Arg Leu Thr |       |       |       |
| 21845   | 21850 | 21855 |       |
| Ala Pro Glu Leu Asp Ile Asp Ala Asn Phe Lys Gln Thr His Val Val |       |       |       |
| 21860   | 21865 | 21870 |       |
| Arg Ala Gly Ala Ser Ile Arg Leu Phe Ile Ala Tyr Gln Gly Arg Pro |       |       |       |
| 21875   | 21880 | 21885 |       |
| Thr Pro Thr Ala Val Trp Ser Lys Pro Asp Ser Asn Leu Ser Leu Arg |       |       |       |
| 21890   | 21895 | 21900 |       |
| Ala Asp Ile His Thr Thr Asp Ser Phe Ser Thr Leu Thr Val Glu Asn |       |       |       |
| 21905   | 21910 | 21915 | 21920 |
| Cys Asn Arg Asn Asp Ala Gly Lys Tyr Thr Leu Thr Val Glu Asn Asn |       |       |       |
| 21925   | 21930 | 21935 |       |
| Ser Gly Ser Lys Ser Ile Thr Phe Thr Val Lys Val Leu Asp Thr Pro |       |       |       |
| 21940   | 21945 | 21950 |       |
| Gly Pro Pro Gly Pro Ile Thr Phe Lys Asp Val Thr Arg Gly Ser Ala |       |       |       |
| 21955   | 21960 | 21965 |       |
| Thr Leu Met Trp Asp Ala Pro Leu Leu Asp Gly Gly Ala Arg Ile His |       |       |       |
| 21970   | 21975 | 21980 |       |
| His Tyr Val Val Glu Lys Arg Glu Ala Ser Arg Arg Ser Trp Gln Val |       |       |       |
| 21985   | 21990 | 21995 | 22000 |
| Ile Ser Glu Lys Cys Thr Arg Gln Ile Phe Lys Val Asn Asp Leu Ala |       |       |       |
| 22005   | 22010 | 22015 |       |
| Glu Gly Val Pro Tyr Tyr Phe Arg Val Ser Ala Val Asn Glu Tyr Gly |       |       |       |
| 22020   | 22025 | 22030 |       |
| Val Gly Glu Pro Tyr Glu Met Pro Glu Pro Ile Val Ala Thr Glu Gln |       |       |       |
| 22035   | 22040 | 22045 |       |
| Pro Ala Pro Pro Arg Arg Leu Asp Val Val Asp Thr Ser Lys Ser Ser |       |       |       |
| 22050   | 22055 | 22060 |       |
| Ala Val Leu Ala Trp Leu Lys Pro Asp His Asp Gly Gly Ser Arg Ile |       |       |       |
| 22065   | 22070 | 22075 | 22080 |
| Thr Gly Tyr Leu Leu Glu Met Arg Gln Lys Gly Ser Asp Leu Trp Val |       |       |       |
| 22085   | 22090 | 22095 |       |
| Glu Ala Gly His Thr Lys Gln Leu Thr Phe Thr Val Glu Arg Leu Val |       |       |       |
| 22100   | 22105 | 22110 |       |
| Glu Lys Thr Glu Tyr Glu Phe Arg Val Lys Ala Lys Asn Asp Ala Gly |       |       |       |
| 22115   | 22120 | 22125 |       |
| Tyr Ser Glu Pro Arg Glu Ala Phe Ser Ser Val Ile Ile Lys Glu Pro |       |       |       |
| 22130   | 22135 | 22140 |       |
| Gln Ile Glu Pro Thr Ala Asp Leu Thr Gly Ile Thr Asn Gln Leu Ile |       |       |       |
| 22145   | 22150 | 22155 | 22160 |
| Thr Cys Lys Ala Gly Ser Pro Phe Thr Ile Asp Val Pro Ile Ser Gly |       |       |       |
| 22165   | 22170 | 22175 |       |
| Arg Pro Ala Pro Lys Val Thr Trp Lys Leu Glu Glu Met Arg Leu Lys |       |       |       |
| 22180   | 22185 | 22190 |       |
| Glu Thr Asp Arg Val Ser Ile Thr Thr Thr Lys Asp Arg Thr Thr Leu |       |       |       |
| 22195   | 22200 | 22205 |       |
| Thr Val Lys Asp Ser Met Arg Gly Asp Ser Gly Arg Tyr Phe Leu Thr |       |       |       |
| 22210   | 22215 | 22220 |       |
| Leu Glu Asn Thr Ala Gly Val Lys Thr Phe Ser Val Thr Val Val Val |       |       |       |
| 22225   | 22230 | 22235 | 22240 |
| Ile Gly Arg Pro Gly Pro Val Thr Gly Pro Ile Glu Val Ser Ser Val |       |       |       |
| 22245   | 22250 | 22255 |       |
| Ser Ala Glu Ser Cys Val Leu Ser Trp Gly Glu Pro Lys Asp Gly Gly |       |       |       |
| 22260   | 22265 | 22270 |       |
| Gly Thr Glu Ile Thr Asn Tyr Ile Val Glu Lys Arg Glu Ser Gly Thr |       |       |       |
| 22275   | 22280 | 22285 |       |
| Thr Ala Trp Gln Leu Val Asn Ser Ser Val Lys Arg Thr Gln Ile Lys |       |       |       |
| 22290   | 22295 | 22300 |       |

Val Thr His Leu Thr Lys Tyr Met Glu Tyr Ser Phe Arg Val Ser Ser  
22305 22310 22315 22320  
Glu Asn Arg Phe Gly Val Ser Lys Pro Leu Glu Ser Ala Pro Ile Ile  
22325 22330 22335  
Ala Glu His Pro Phe Val Pro Pro Ser Ala Pro Thr Arg Pro Glu Val  
22340 22345 22350  
Tyr His Val Ser Ala Asn Ala Met Ser Ile Arg Trp Glu Glu Pro Tyr  
22355 22360 22365  
His Asp Gly Gly Ser Lys Ile Ile Gly Tyr Trp Val Glu Lys Lys Glu  
22370 22375 22380  
Arg Asn Thr Ile Leu Trp Val Lys Glu Asn Lys Val Pro Cys Leu Glu  
22385 22390 22395 22400  
Cys Asn Tyr Lys Val Thr Gly Leu Val Glu Gly Leu Glu Tyr Gln Phe  
22405 22410 22415  
Arg Thr Tyr Ala Leu Asn Ala Ala Gly Val Ser Lys Ala Ser Glu Ala  
22420 22425 22430  
Ser Arg Pro Ile Met Ala Gln Asn Pro Val Asp Ala Pro Gly Arg Pro  
22435 22440 22445  
Glu Val Thr Asp Val Thr Arg Ser Thr Val Ser Leu Ile Trp Ser Ala  
22450 22455 22460  
Pro Ala Tyr Asp Gly Gly Ser Lys Val Val Gly Tyr Ile Ile Glu Arg  
22465 22470 22475 22480  
Lys Pro Val Ser Glu Val Gly Asp Gly Arg Trp Leu Lys Cys Asn Tyr  
22485 22490 22495  
Thr Ile Val Ser Asp Asn Phe Phe Thr Val Thr Ala Leu Ser Glu Gly  
22500 22505 22510  
Asp Thr Tyr Glu Phe Arg Val Leu Ala Lys Asn Ala Ala Gly Val Ile  
22515 22520 22525  
Ser Lys Gly Ser Glu Ser Thr Gly Pro Val Thr Cys Arg Asp Glu Tyr  
22530 22535 22540  
Ala Pro Pro Lys Ala Glu Leu Asp Ala Arg Leu His Gly Asp Leu Val  
22545 22550 22555 22560  
Thr Ile Arg Ala Gly Ser Asp Leu Val Leu Asp Ala Ala Val Gly Gly  
22565 22570 22575  
Lys Pro Glu Pro Lys Ile Ile Trp Thr Lys Gly Asp Lys Glu Leu Asp  
22580 22585 22590  
Leu Cys Glu Lys Val Ser Leu Gln Tyr Thr Gly Lys Arg Ala Thr Ala  
22595 22600 22605  
Val Ile Lys Phe Cys Asp Arg Ser Asp Ser Gly Lys Tyr Thr Leu Thr  
22610 22615 22620  
Val Lys Asn Ala Ser Gly Thr Lys Ala Val Ser Val Met Val Lys Val  
22625 22630 22635 22640  
Leu Asp Ser Pro Gly Pro Cys Gly Lys Leu Thr Val Ser Arg Val Thr  
22645 22650 22655  
Gln Glu Lys Cys Thr Leu Ala Trp Ser Leu Pro Gln Glu Asp Gly Gly  
22660 22665 22670  
Ala Glu Ile Thr His Tyr Ile Val Glu Arg Arg Glu Thr Ser Arg Leu  
22675 22680 22685  
Asn Trp Val Ile Val Glu Gly Glu Cys Pro Thr Leu Ser Tyr Val Val  
22690 22695 22700  
Thr Arg Leu Ile Lys Asn Asn Glu Tyr Ile Phe Arg Val Arg Ala Val  
22705 22710 22715 22720  
Asn Lys Tyr Gly Pro Gly Val Pro Val Glu Ser Glu Pro Ile Val Ala  
22725 22730 22735  
Arg Asn Ser Phe Thr Ile Pro Ser Pro Pro Gly Ile Pro Glu Glu Val  
22740 22745 22750  
Gly Thr Gly Lys Glu His Ile Ile Ile Gln Trp Thr Lys Pro Glu Ser  
22755 22760 22765  
Asp Gly Gly Asn Glu Ile Ser Asn Tyr Leu Val Asp Lys Arg Glu Lys



|   |       |       |
|---|-------|-------|
| 22770   | 22775 | 22780 |
| Glu Ser Leu Arg Trp Thr Arg Val Asn Lys Asp Tyr Val Val Tyr Asp |       |       |
| 22785   | 22790 | 22795 |
| Thr Arg Leu Lys Val Thr Ser Leu Met Glu Gly Cys Asp Tyr Gln Phe |       | 22800 |
|   | 22805 | 22810 |
| Arg Val Thr Ala Val Asn Ala Ala Gly Asn Ser Glu Pro Ser Glu Arg |       | 22815 |
|   | 22820 | 22825 |
| Ser Asn Phe Ile Ser Cys Arg Glu Pro Ser Tyr Thr Pro Gly Pro Pro |       | 22830 |
|   | 22835 | 22840 |
| Ser Ala Pro Arg Val Val Asp Thr Thr Lys His Ser Ile Ser Leu Ala |       | 22845 |
|   | 22850 | 22855 |
| Trp Thr Lys Pro Met Tyr Asp Gly Gly Thr Asp Ile Val Gly Tyr Val |       | 22860 |
| 22865   | 22870 | 22875 |
| Leu Glu Met Gln Glu Lys Asp Thr Asp Gln Trp Tyr Arg Val His Thr |       | 22880 |
|   | 22885 | 22890 |
| Asn Ala Thr Ile Arg Asn Thr Glu Phe Thr Val Pro Asp Leu Lys Met |       | 22895 |
|   | 22900 | 22905 |
| Gly Gln Lys Tyr Ser Phe Arg Val Ala Ala Val Asn Val Lys Gly Met |       | 22910 |
|   | 22915 | 22920 |
| Ser Glu Tyr Ser Glu Ser Ile Ala Glu Ile Glu Pro Val Glu Arg Ile |       | 22925 |
|   | 22930 | 22935 |
| Glu Ile Pro Asp Leu Glu Leu Ala Asp Asp Leu Lys Lys Thr Val Thr |       | 22940 |
| 22945   | 22950 | 22955 |
| Ile Arg Ala Gly Ala Ser Leu Arg Leu Met Val Ser Val Ser Gly Arg |       | 22960 |
|   | 22965 | 22970 |
| Pro Pro Pro Val Ile Thr Trp Ser Lys Gln Gly Ile Asp Leu Ala Ser |       | 22975 |
|   | 22980 | 22985 |
| Arg Ala Ile Ile Asp Thr Thr Glu Ser Tyr Ser Leu Leu Ile Val Asp |       | 22990 |
|   | 22995 | 23000 |
| Lys Val Asn Arg Tyr Asp Ala Gly Lys Tyr Thr Ile Glu Ala Glu Asn |       | 23005 |
|   | 23010 | 23015 |
| Gln Ser Gly Lys Lys Ser Ala Thr Val Leu Val Lys Val Tyr Asp Thr |       | 23020 |
| 23025   | 23030 | 23035 |
| Pro Gly Pro Cys Pro Ser Val Lys Val Lys Glu Val Ser Arg Asp Ser |       | 23040 |
|   | 23045 | 23050 |
| Val Thr Ile Thr Trp Glu Ile Pro Thr Ile Asp Gly Gly Ala Pro Ile |       | 23055 |
|   | 23060 | 23065 |
| Asn Asn Tyr Ile Val Glu Lys Arg Glu Ala Ala Met Arg Ala Phe Lys |       | 23070 |
|   | 23075 | 23080 |
| Thr Val Thr Thr Lys Cys Ser Lys Thr Leu Tyr Arg Ile Ser Gly Leu |       | 23085 |
|   | 23090 | 23095 |
| Val Glu Gly Thr Met His Tyr Phe Arg Val Leu Pro Glu Asn Ile Tyr |       | 23100 |
| 23105   | 23110 | 23115 |
| Gly Ile Gly Glu Pro Cys Glu Thr Ser Asp Ala Val Leu Val Ser Glu |       | 23120 |
|   | 23125 | 23130 |
| Val Pro Leu Val Pro Ala Lys Leu Glu Val Val Asp Val Thr Lys Ser |       | 23135 |
|   | 23140 | 23145 |
| Thr Val Thr Leu Ala Trp Glu Lys Pro Leu Tyr Asp Gly Gly Ser Arg |       | 23150 |
|   | 23155 | 23160 |
| Leu Thr Gly Tyr Val Leu Glu Ala Cys Lys Ala Gly Thr Glu Arg Trp |       | 23165 |
|   | 23170 | 23175 |
| Met Lys Val Val Thr Leu Lys Pro Thr Val Leu Glu His Thr Val Thr |       | 23180 |
| 23185   | 23190 | 23195 |
| Ser Leu Asn Glu Gly Gln Tyr Leu Phe Arg Ile Arg Ala Gln Asn     |       | 23200 |
|   | 23205 | 23210 |
| Glu Lys Gly Val Ser Glu Pro Arg Glu Thr Val Thr Ala Val Thr Val |       | 23215 |
|   | 23220 | 23225 |
| Gln Asp Leu Arg Val Leu Pro Thr Ile Asp Leu Ser Thr Met Pro Gln |       | 23230 |
|   | 23235 | 23240 |
|   |       | 23245 |

Lys Thr Ile His Val Pro Ala Gly Arg Pro Val Glu Leu Val Ile Pro  
 23250 23255 23260  
 Ile Ala Gly Arg Pro Pro Pro Ala Ala Ser Trp Phe Phe Ala Gly Ser  
 23265 23270 23275 23280  
 Lys Leu Arg Glu Ser Glu Arg Val Thr Val Glu Thr His Thr Lys Val  
 23285 23290 23295  
 Ala Lys Leu Thr Ile Arg Glu Thr Thr Ile Arg Asp Thr Gly Glu Tyr  
 23300 23305 23310  
 Thr Leu Glu Leu Lys Asn Val Thr Gly Thr Thr Ser Glu Thr Ile Lys  
 23315 23320 23325  
 Val Ile Ile Leu Asp Lys Pro Gly Pro Pro Thr Gly Pro Ile Lys Ile  
 23330 23335 23340  
 Asp Glu Ile Asp Ala Thr Ser Ile Thr Ile Ser Trp Glu Pro Pro Glu  
 23345 23350 23355 23360  
 Leu Asp Gly Gly Ala Pro Leu Ser Gly Tyr Val Val Glu Gln Arg Asp  
 23365 23370 23375  
 Ala His Arg Pro Gly Trp Leu Pro Val Ser Glu Ser Val Thr Arg Ser  
 23380 23385 23390  
 Thr Phe Lys Phe Thr Arg Leu Thr Glu Gly Asn Glu Tyr Val Phe Arg  
 23395 23400 23405  
 Val Ala Ala Thr Asn Arg Phe Gly Ile Gly Ser Tyr Leu Gln Ser Glu  
 23410 23415 23420  
 Val Ile Glu Cys Arg Ser Ser Ile Arg Ile Pro Gly Pro Pro Glu Thr  
 23425 23430 23435 23440  
 Leu Gln Ile Phe Asp Val Ser Arg Asp Gly Met Thr Leu Thr Trp Tyr  
 23445 23450 23455  
 Pro Pro Glu Asp Asp Gly Gly Ser Gln Val Thr Gly Tyr Ile Val Glu  
 23460 23465 23470  
 Arg Lys Glu Val Arg Ala Asp Arg Trp Val Arg Val Asn Lys Val Pro  
 23475 23480 23485  
 Val Thr Met Thr Arg Tyr Arg Ser Thr Gly Leu Thr Glu Gly Leu Glu  
 23490 23495 23500  
 Tyr Glu His Arg Val Thr Ala Ile Asn Ala Arg Gly Ser Gly Lys Pro  
 23505 23510 23515 23520  
 Ser Arg Pro Ser Lys Pro Ile Val Ala Met Asp Pro Ile Ala Pro Pro  
 23525 23530 23535  
 Gly Lys Pro Gln Asn Pro Arg Val Thr Asp Thr Thr Arg Thr Ser Val  
 23540 23545 23550  
 Ser Leu Ala Trp Ser Val Pro Glu Asp Glu Gly Gly Ser Lys Val Thr  
 23555 23560 23565  
 Gly Tyr Leu Ile Glu Met Gln Lys Val Asp Gln His Glu Trp Thr Lys  
 23570 23575 23580  
 Cys Asn Thr Thr Pro Thr Lys Ile Arg Glu Tyr Thr Leu Thr His Leu  
 23585 23590 23595 23600  
 Pro Gln Gly Ala Glu Tyr Arg Phe Arg Val Leu Ala Cys Asn Ala Gly  
 23605 23610 23615  
 Gly Pro Gly Glu Pro Ala Glu Val Pro Gly Thr Val Lys Val Thr Glu  
 23620 23625 23630  
 Met Leu Glu Tyr Pro Asp Tyr Glu Leu Asp Glu Arg Tyr Gln Glu Gly  
 23635 23640 23645  
 Ile Phe Val Arg Gln Gly Gly Val Ile Arg Leu Thr Ile Pro Ile Lys  
 23650 23655 23660  
 Gly Lys Pro Phe Pro Ile Cys Lys Trp Thr Lys Glu Gly Gln Asp Ile  
 23665 23670 23675 23680  
 Ser Lys Arg Ala Met Ile Ala Thr Ser Glu Thr His Thr Glu Leu Val  
 23685 23690 23695  
 Ile Lys Glu Ala Asp Arg Gly Asp Ser Gly Thr Tyr Asp Leu Val Leu  
 23700 23705 23710  
 Glu Asn Lys Cys Gly Lys Lys Ala Val Tyr Ile Lys Val Arg Val Ile

|                             |                         |                         |
|-----------------------------|-------------------------|-------------------------|
| 23715                       | 23720                   | 23725                   |
| Gly Ser Pro Asn Ser Pro     | Glu Gly Pro Leu         | Glu Tyr Asp Asp Ile Gln |
| 23730                       | 23735                   | 23740                   |
| Val Arg Ser Val Arg Val     | Ser Trp Arg Pro         | Pro Ala Asp Asp Gly Gly |
| 23745                       | 23750                   | 23755                   |
| Ala Asp Ile Leu Gly Tyr Ile | Leu Glu Arg Arg Glu Val | Pro Lys Ala             |
| 23765                       | 23770                   | 23775                   |
| Ala Trp Tyr Thr Ile Asp Ser | Arg Val Arg Gly Thr Ser | Leu Val Val             |
| 23780                       | 23785                   | 23790                   |
| Lys Gly Leu Lys Glu Asn Val | Glu Tyr His Phe Arg Val | Ser Ala Glu             |
| 23795                       | 23800                   | 23805                   |
| Asn Gln Phe Gly Ile Ser Lys | Pro Leu Lys Ser Glu Glu | Pro Val Thr             |
| 23810                       | 23815                   | 23820                   |
| Pro Lys Thr Pro Leu Asn Pro | Glu Pro Pro Ser Asn Pro | Pro Glu                 |
| 23825                       | 23830                   | 23835                   |
| Val Leu Asp Val Thr Lys Ser | Ser Val Ser Leu Ser Trp | Ser Arg Pro             |
| 23845                       | 23850                   | 23855                   |
| Lys Asp Asp Gly Gly Ser Arg | Val Thr Gly Tyr Tyr Ile | Glu Arg Lys             |
| 23860                       | 23865                   | 23870                   |
| Glu Thr Ser Thr Asp Lys Trp | Val Arg His Asn Lys Thr | Gln Ile Thr             |
| 23875                       | 23880                   | 23885                   |
| Thr Thr Met Tyr Thr Val Thr | Gly Leu Val Pro Asp Ala | Glu Tyr Gln             |
| 23890                       | 23895                   | 23900                   |
| Phe Arg Ile Ile Ala Gln Asn | Asp Val Gly Leu Ser Glu | Thr Ser Pro             |
| 23905                       | 23910                   | 23915                   |
| Ala Ser Glu Pro Val Val Cys | Lys Asp Pro Phe Asp Lys | Pro Ser Gln             |
| 23925                       | 23930                   | 23935                   |
| Pro Gly Glu Leu Glu Ile Leu | Ser Ile Ser Lys Asp Ser | Val Thr Leu             |
| 23940                       | 23945                   | 23950                   |
| Gln Trp Glu Lys Pro Glu Cys | Asp Gly Gly Lys Glu Ile | Leu Gly Tyr             |
| 23955                       | 23960                   | 23965                   |
| Trp Val Glu Tyr Arg Gln Ser | Gly Asp Ser Ala Trp Lys | Lys Ser Asn             |
| 23970                       | 23975                   | 23980                   |
| Lys Glu Arg Ile Lys Asp Lys | Gln Phe Thr Ile Gly Gly | Leu Leu Glu             |
| 23985                       | 23990                   | 23995                   |
| Ala Thr Glu Tyr Glu Phe Arg | Val Phe Ala Glu Asn Glu | Thr Gly Leu             |
| 24005                       | 24010                   | 24015                   |
| Ser Arg Pro Arg Arg Thr Ala | Met Ser Ile Lys Thr Lys | Leu Thr Ser             |
| 24020                       | 24025                   | 24030                   |
| Gly Glu Ala Pro Gly Ile Arg | Lys Glu Met Lys Asp Val | Thr Thr Lys             |
| 24035                       | 24040                   | 24045                   |
| Leu Gly Glu Ala Ala Gln Leu | Ser Cys Gln Ile Val Gly | Arg Pro Leu             |
| 24050                       | 24055                   | 24060                   |
| Pro Asp Ile Lys Trp Tyr Arg | Phe Gly Lys Glu Leu Ile | Gln Ser Arg             |
| 24065                       | 24070                   | 24075                   |
| Lys Tyr Lys Met Ser Ser Asp | Gly Arg Thr His Thr Leu | Thr Val Met             |
| 24085                       | 24090                   | 24095                   |
| Thr Glu Glu Gln Glu Asp Glu | Gly Val Tyr Thr Cys Ile | Ala Thr Asn             |
| 24100                       | 24105                   | 24110                   |
| Glu Val Gly Glu Val Glu Thr | Ser Ser Lys Leu Leu Leu | Gln Ala Thr             |
| 24115                       | 24120                   | 24125                   |
| Pro Gln Phe His Pro Gly Tyr | Pro Leu Lys Glu Lys Tyr | Tyr Gly Ala             |
| 24130                       | 24135                   | 24140                   |
| Val Gly Ser Thr Leu Arg Leu | His Val Met Tyr Ile Gly | Arg Pro Val             |
| 24145                       | 24150                   | 24155                   |
| Pro Ala Met Thr Trp Phe His | Gly Gln Lys Leu Leu Gln | Asn Ser Glu             |
| 24165                       | 24170                   | 24175                   |
| Asn Ile Thr Ile Glu Asn Thr | Glu His Tyr Thr His Leu | Val Met Lys             |
| 24180                       | 24185                   | 24190                   |

Asn Val Gln Arg Lys Thr His Ala Gly Lys Tyr Lys Val Gln Leu Ser  
 24195 24200 24205  
 Asn Val Phe Gly Thr Val Asp Ala Ile Leu Asp Val Glu Ile Gln Asp  
 24210 24215 24220  
 Lys Pro Asp Lys Pro Thr Gly Pro Ile Val Ile Glu Ala Leu Leu Lys  
 24225 24230 24235 24240  
 Asn Ser Ala Val Ile Ser Trp Lys Pro Pro Ala Asp Asp Gly Gly Ser  
 24245 24250 24255  
 Trp Ile Thr Asn Tyr Val Val Glu Lys Cys Glu Ala Lys Glu Gly Ala  
 24260 24265 24270  
 Glu Trp Gln Leu Val Ser Ser Ala Ile Ser Val Thr Thr Cys Arg Ile  
 24275 24280 24285  
 Val Asn Leu Thr Glu Asn Ala Gly Tyr Tyr Phe Arg Val Ser Ala Gln  
 24290 24295 24300  
 Asn Thr Phe Gly Ile Ser Asp Pro Leu Glu Val Ser Ser Val Val Ile  
 24305 24310 24315 24320  
 Ile Lys Ser Pro Phe Glu Lys Pro Gly Ala Pro Gly Lys Pro Thr Ile  
 24325 24330 24335  
 Thr Ala Val Thr Lys Asp Ser Cys Val Val Ala Trp Lys Pro Pro Ala  
 24340 24345 24350  
 Ser Asp Gly Gly Ala Lys Ile Arg Asn Tyr Tyr Leu Glu Lys Arg Glu  
 24355 24360 24365  
 Lys Lys Gln Asn Lys Trp Ile Ser Val Thr Thr Glu Glu Ile Arg Glu  
 24370 24375 24380  
 Thr Val Phe Ser Val Lys Asn Leu Ile Glu Gly Leu Glu Tyr Glu Phe  
 24385 24390 24395 24400  
 Arg Val Lys Cys Glu Asn Leu Gly Gly Glu Ser Glu Trp Ser Glu Ile  
 24405 24410 24415  
 Ser Glu Pro Ile Thr Pro Lys Ser Asp Val Pro Ile Gln Ala Pro His  
 24420 24425 24430  
 Phe Lys Glu Glu Leu Arg Asn Leu Asn Val Arg Tyr Gln Ser Asn Ala  
 24435 24440 24445  
 Thr Leu Val Cys Lys Val Thr Gly His Pro Lys Pro Ile Val Lys Trp  
 24450 24455 24460  
 Tyr Arg Gln Gly Lys Glu Ile Ile Ala Asp Gly Leu Lys Tyr Arg Ile  
 24465 24470 24475 24480  
 Gln Glu Phe Lys Gly Gly Tyr His Gln Leu Ile Ile Ala Ser Val Thr  
 24485 24490 24495  
 Asp Asp Asp Ala Thr Val Tyr Gln Val Arg Ala Thr Asn Gln Gly Gly  
 24500 24505 24510  
 Ser Val Ser Gly Thr Ala Ser Leu Glu Val Glu Val Pro Ala Lys Ile  
 24515 24520 24525  
 His Leu Pro Lys Thr Leu Glu Gly Met Gly Ala Val His Ala Leu Arg  
 24530 24535 24540  
 Gly Glu Val Val Ser Ile Lys Ile Pro Phe Ser Gly Lys Pro Asp Pro  
 24545 24550 24555 24560  
 Val Ile Thr Trp Gln Lys Gly Gln Asp Leu Ile Asp Asn Asn Gly His  
 24565 24570 24575  
 Tyr Gln Val Ile Val Thr Arg Ser Phe Thr Ser Leu Val Phe Pro Asn  
 24580 24585 24590  
 Gly Val Glu Arg Lys Asp Ala Gly Phe Tyr Val Val Cys Ala Lys Asn  
 24595 24600 24605  
 Arg Phe Gly Ile Asp Gln Lys Thr Val Glu Leu Asp Val Ala Asp Val  
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 Val Asn Leu Thr Trp Thr Glu Pro Ala Ser Asp Gly Gly Ser Lys Ile  
 24645 24650 24655  
 Thr Asn Tyr Ile Val Glu Lys Cys Ala Thr Thr Ala Glu Arg Trp Leu

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| Arg Val Gly Gln Ala Arg Glu Thr Arg Tyr Thr Val Ile Asn Leu Phe | 24660 | 24665 | 24670 |
| Gly Lys Thr Ser Tyr Gln Phe Arg Val Ile Ala Glu Asn Lys Phe Gly | 24675 | 24680 | 24685 |
| Leu Ser Lys Pro Ser Glu Pro Ser Glu Pro Thr Ile Thr Lys Glu Asp | 24690 | 24695 | 24700 |
| Lys Thr Arg Ala Met Asn Tyr Asp Glu Glu Val Asp Glu Thr Arg Glu | 24705 | 24710 | 24715 |
| Val Ser Met Thr Lys Ala Ser His Ser Ser Thr Lys Glu Leu Tyr Glu | 24720 | 24725 | 24730 |
| Lys Tyr Met Ile Ala Glu Asp Leu Gly Arg Gly Glu Phe Gly Ile Val | 24735 | 24740 | 24745 |
| His Arg Cys Val Glu Thr Ser Ser Lys Lys Thr Tyr Met Ala Lys Phe | 24750 | 24755 | 24760 |
| Val Lys Val Lys Gly Thr Asp Gln Val Leu Val Lys Lys Glu Ile Ser | 24765 | 24770 | 24775 |
| Ile Leu Asn Ile Ala Arg His Arg Asn Ile Leu His Leu His Glu Ser | 24780 | 24785 | 24790 |
| Phe Glu Ser Met Glu Glu Leu Val Met Ile Phe Glu Phe Ile Ser Gly | 24800 | 24805 | 24810 |
| Leu Asp Ile Phe Glu Arg Ile Asn Thr Ser Ala Phe Glu Leu Asn Glu | 24815 | 24820 | 24825 |
| Arg Glu Ile Val Ser Tyr Val His Gln Val Cys Glu Ala Leu Gln Phe | 24830 | 24835 | 24840 |
| Leu His Ser His Asn Ile Gly His Phe Asp Ile Arg Pro Glu Asn Ile | 24845 | 24850 | 24855 |
| Ile Tyr Gln Thr Arg Arg Ser Ser Thr Ile Lys Ile Ile Glu Phe Gly | 24860 | 24865 | 24870 |
| Gln Ala Arg Gln Leu Lys Pro Gly Asp Asn Phe Arg Leu Leu Phe Thr | 24875 | 24880 | 24885 |
| Ala Pro Glu Tyr Tyr Ala Pro Glu Val His Gln His Asp Val Val Ser | 24890 | 24895 | 24900 |
| Thr Ala Thr Asp Met Trp Ser Leu Gly Thr Leu Val Tyr Val Leu Leu | 24910 | 24915 | 24920 |
| Ser Gly Ile Asn Pro Phe Leu Ala Glu Thr Asn Gln Gln Ile Ile Glu | 24925 | 24930 | 24935 |
| Asn Ile Met Asn Ala Glu Tyr Thr Phe Asp Glu Glu Ala Phe Lys Glu | 24940 | 24945 | 24950 |
| Ile Ser Ile Glu Ala Met Asp Phe Val Asp Arg Leu Leu Val Lys Glu | 24955 | 24960 | 24965 |
| Arg Lys Ser Arg Met Thr Ala Ser Glu Ala Leu Gln His Pro Trp Leu | 24970 | 24975 | 24980 |
| Lys Gln Lys Ile Glu Arg Val Ser Thr Lys Val Ile Arg Thr Leu Lys | 24985 | 24990 | 24995 |
| His Arg Arg Tyr Tyr His Thr Leu Ile Lys Lys Asp Leu Asn Met Val | 25000 | 25005 | 25010 |
| Val Ser Ala Ala Arg Ile Ser Cys Gly Gly Ala Ile Arg Ser Gln Lys | 25015 | 25020 | 25025 |
| Gly Val Ser Val Ala Lys Val Lys Val Ala Ser Ile Glu Ile Gly Pro | 25030 | 25035 | 25040 |
| Val Ser Gly Gln Ile Met His Ala Val Gly Glu Glu Gly Gly His Val | 25045 | 25050 | 25055 |
| Lys Tyr Val Cys Lys Ile Glu Asn Tyr Asp Gln Ser Thr Gln Val Thr | 25060 | 25065 | 25070 |
| Trp Tyr Phe Gly Val Arg Gln Leu Glu Asn Ser Glu Lys Tyr Glu Ile | 25075 | 25080 | 25085 |
| Thr Tyr Glu Asp Gly Val Ala Ile Leu Tyr Val Lys Asp Ile Thr Lys | 25090 | 25095 | 25100 |
|   | 25105 | 25110 | 25115 |
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 Asp Ser Ser Tyr Ala Glu Leu Phe Val Lys Gly Val Arg Glu Val Tyr  
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|                 |                     |                     |                 |
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| Gly Val Glu Leu | Thr Asn Ser Glu     | Glu Tyr Arg Tyr Gly | Val Ser Gly     |
|                 | 26580               | 26585               | 26590           |
| Ser Asp Gln Thr | Leu Thr Ile Lys     | Gln Ala Ser His     | Arg Asp Glu Gly |
|                 | 26595               | 26600               | 26605           |
| Ile Leu Thr Cys | Ile Ser Lys Thr     | Lys Glu Gly Ile     | Val Lys Cys Gln |
|                 | 26610               | 26615               | 26620           |
| Tyr Asp Leu Thr | Leu Ser Lys Glu     | Leu Ser Asp Ala     | Pro Ala Phe Ile |
|                 | 26625               | 26630               | 26635           |
| Ser Gln Pro Arg | Ser Gln Asn Ile     | Asn Glu Gly Gln     | Asn Val Leu Phe |
|                 | 26645               | 26650               | 26655           |
| Thr Cys Glu Ile | Ser Gly Glu Pro     | Ser Pro Glu Ile     | Glu Trp Phe Lys |
|                 | 26660               | 26665               | 26670           |
| Asn Asn Leu Pro | Ile Ser Ile Ser     | Ser Asn Val Ser     | Ile Ser Arg Ser |
|                 | 26675               | 26680               | 26685           |
| Arg Asn Val Tyr | Ser Leu Glu Ile     | Arg Asn Ala Ser     | Val Ser Asp Ser |
|                 | 26690               | 26695               | 26700           |
| Gly Lys Tyr Thr | Ile Lys Ala Lys     | Asn Phe Arg Gly     | Gln Cys Ser Ala |
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|                 | 26770               | 26775               | 26780           |
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| Met Ser Ser Ser | Ser Phe Met Gly     | Ile Ser Asn Met     | Thr Gln Leu Glu |
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|                 | 26820               | 26825               | 26830           |
| Lys Ile Glu Ala | Leu Pro Ser Asp     | Ile Ser Ile Asp     | Glu Gly Lys Val |
|                 | 26835               | 26840               | 26845           |
| Leu Thr Val Ala | Cys Ala Phe Thr     | Gly Glu Pro Thr     | Pro Glu Val Thr |
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| Trp Ser Cys Gly | Gly Arg Lys Ile     | His Ser Gln Glu     | Gln Gly Arg Phe |
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| His Ile Glu Asn | Thr Asp Asp Leu     | Thr Thr Leu Ile     | Ile Met Asp Val |
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| Gln Lys Gln Asp | Gly Gly Leu Tyr     | Thr Leu Ser Leu     | Gly Asn Glu Phe |
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22

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